1997 DANDENONG RANGES FIRES

INQUESTS INTO THE DEATHS OF
JENNIFER LOUISE LINDROTH, GRAHAM KINGSLEY LINDROTH
AND GENEVIEVE ERIN DURING A FIRE AT FERNY CREEK AND FOUR
OTHER FIRES IN THE DANDENONG RANGES
ON 21ST JANUARY 1997

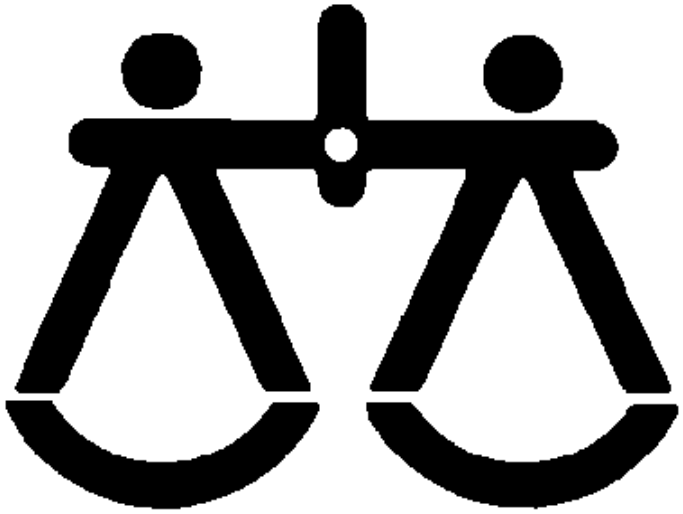
Coronial Services Centre Kavanagh Street Southbank, 3006

1997 DANDENONG FIRES
CONTENTS

APPENDICES

1997 DANDENONG RANGES FIRES
Coroner's Case Numbers

The Dandenong Ranges Fire inquests (Ferny Creek, Upwey, Kalorama, Montrose and Mount Dandenong) are dealt with under Case Number 1677/98 and the numbers for the deaths of Jennifer Louise Lindroth, Graham Kingsley Lindroth and Genevieve Erin are 238/97, 222/97 and 226/97 respectively.



STATE
CORONER
VICTORIA

Record of Investigations into the deaths of Jennifer Louise Lindroth, Graham Kingsley Lindroth and Genevieve Erin in a fire at Ferny Creek and into a series of fires in the Dandenong Ranges area all of which occurred on 21st January 1997

Held at the Coronial Services Centre, Southbank
Between 31st August and 11th September 1998.
An inspection of the area was conducted in the
Dandenong Ranges on 10th September.

INTRODUCTION

There were a total of 511 fires throughout Victoria over a two-day period on 20th and 21st January 1997. The incidents ranged from small fires to larger fires surrounding the towns of Creswick and Heathcote in the north of Victoria and Arthurs Seat in the south-eastern area of Port Phillip Bay. The fire at Creswick has been previously dealt with by an inquest by another coroner.[1]

However, it also should be noted that many of the fires occurring over the two days in January 1997 have not been the subject of coronial investigation and inquest. The details on all of the fires are contained in a comprehensive report prepared by the Country Fire Authority (CFA) and the Department of Natural Resources and Environment (*DNRE) `Review of Significant Fires of 20/21 January 1997 in Victoria.'* [2]

The fire inquests, which are the subject of these findings, occurred in the Dandenong Ranges on 21st January and include Ferny Creek, Upwey and Kalorama. Considerable property damage occurred during these fires before they were brought under control. Three deaths occurred in the Ferny Creek fire.

Also there were two other smaller fires in the Dandenong Ranges on 21st January which were brought under control with no property damage – the Fussell Road, Montrose fire and the Trig Track, Mount Dandenong fire.

There were a number of hot days preceding the 21st January. On the day of the fires in the Dandenongs it was a declared *`Total Fire Ban'* for Victoria with a temperature of 35 degrees and a hot north/westerly 33 knot wind. The humidity was 18 per cent.

Findings on the deaths and fire at Ferny Creek

The deaths of Jennifer Lindroth, Graham Lindroth and Genevieve Erin all occurred on the 21st January 1997 at 29 Seabreeze Avenue, Ferny Creek. Jennifer Lindroth died from fire exposure, Graham Lindroth died from carbon monoxide poisoning and fire exposure and Genevieve Erin died from fire exposure.

The circumstances

Mr. and Mrs. Lindroth resided at 29 Seabreeze Avenue. At the time of the fire Mr. Lindroth was aged 26 and Mrs. Lindroth, 24. Ms. Erin, who was a nearby neighbour of the Lindroths, was aged 50. Erin resided at 31 Seabreeze Avenue.

Both Mrs. Lindroth and Ms. Erin were at their respective homes in Ferny Creek on the 21st January when the fire commenced at about 12.30pm in the area of Tobruk Avenue, The Basin. The fire moved at a rapid rate in a South-easterly direction towards Janesdale Avenue, Ferny Creek then in a southerly direction down Seabreeze, engulfing a number of

---

1 A copy of the finding into the Creswick fire is attached. The finding deals with safety issues for fire fighters.

2 Called the WOPER REPORT.

houses in the area including 29 Seabreeze Avenue. Erin's home at 31 Seabreeze was also destroyed.

At about 12 noon, shortly before the fire commenced at The Basin, Mrs. Lindroth contacted her husband Graham at his work. At this time he decided to return home as there were other fires in the Hills and it appeared that the wind had changed. Lindroth worked at Norwood Industries Pty. Ltd. in Rushdale Street, Knoxfield as a horticulturalist. Norwood Industries was about 15 minutes drive from the Lindroth home in Ferny Creek.

Earlier in the morning, Mrs. Jacqueline Bell (Jennifer Lindroth's mother) stated that at about 11.15am from Bayswater she observed smoke in the area of the television towers on Mt. Dandenong. She telephoned her daughter and:

`...told her that there was fires at Kalorama, she wasn't aware of those fires because there was no smoke or sirens. I asked her to come down off the mountain but she told me that she had one child – Imogen with her and she was expecting 2 more. Jennifer minded children during the day for the Shire.'

Mrs. Bell suggested that her daughter bring the child to Bayswater, however as she did not have a contact number for the parents of the children that were due to arrive at Seabreeze Avenue, she elected to stay. Apparently, Lindroth was not concerned, at that stage, as the fires were a long way from where she lived. During this time Lindroth advised Bell that she had contacted her husband, Graham at work and he was not intending to return home. In a later telephone contact with her mother Lindroth indicated that the two children were not coming and the other child was due to be collected by a parent. Apparently, by that stage Graham was returning home and Lindroth was:

`...filling up the bath and getting wet towels in case they were needed. There was still no sign of fires in that area at that time. Jennifer sounded totally calm during that conversation...'

In a further telephone call Mrs. Lindroth told her mother that her husband Graham was home and he was:

`...on the roof filling up the spouting with water. Jennifer told me that there was a little bit of smoke around but she didn't seem worried or panicky.'

A few minutes after the penultimate telephone call Mrs. Bell heard someone on the radio say:

`...that he was in Ferntree Gully and he could see a fire racing up the Mountain. Once I had heard that I immediately rang Jennifer. She told me that the sky had gone black and that it was becoming a bit scary, her next words were ``Mum I've got to go it's here.'' I said ``Yeah go.'' and Jennifer hung up.'

Mrs. Bell considered that her daughter and son-in-law's intention, in the event of a fire, was to evacuate. Bell commented:

`.... I had nagged Jennifer every summer about the dangers of fire in the area. Graeme had cleared the block and made all the preparations for fire and I believe that they got caught unawares by the fire and didn't have time to leave.'

Mr. Geoffrey Bell also separately telephoned his daughter at 12.16pm. His notes of the conversation indicate that Graham Lindroth was home and that they were only aware of fires at Mt. Dandenong. Also the Lindroths had `...started to pack things in the car to leave...' However, Jennifer qualified this by stating:

`...but there is no problem yet and we know where to go. There's two places to register...'

Mr. Bell also commented on the fire preparation at 29 Seabreeze. He stated that his daughter and son-in-law had:

`...a number of fire prevention measures in place in case of bushfire. They had a system relating to the roof where they would block the spouts and release water from filled bottles that were on the roof. They had a sprinkler system on the property that would assist. Graeme was always on the roof cleaning the gutters of leaves. I actually minded the house for them on three occasions for up to 10 days at a time. I always got the impression from them that they would damp the house down and then evacuate in case of a bushfire.'

Also Mr. Bell commented:

`...Knowing what Jenny and Graeme had said and done beforehand in relation to their bushfire preparation I can't understand why they would have not evacuated unless they were unaware of the fire.

When I stayed there in the past and I have experienced some strong winds and I know that if anyone had warned or attempted to warn them of the fire, other than knock on the door then it would have been useless. They wouldn't have heard anything from inside.'

Neighbours of Mr. and Mrs. Lindroth and Ms. Erin also made statements about the fire. One witness, Doug McKay, gives some clue as to Erin's movements on the morning. McKay, who lived at 33 Seabreeze Avenue, and his partner Cheryl Martin were evacuating the area at about 11.20am when Martin spoke to Erin. Apparently:

`...Genevieve was actually in her car when Cheryl spoke to her. She had just tried to go to Olinda but could not get out because of roadblocks. We told her that we were leaving and in the process of putting things in the car and she said that it was a good idea and that she might do that too...'

Mr. McKay and Ms. Martin left the area and travelled to the Knox City Shopping Centre. Apparently they had left $2000 (in cash) in their freezer, and on arriving at Knox at about 12.30pm, telephoned Erin (who had a key to their house) to see if she could retrieve the money. Erin said that she did not have the key but that `...she would walk around the house to see if she could find a way in.' McKay told her not to worry and `just to pack her things and get off the mountain.'

Mr. McKay, who had lost his house and possessions in the fire, said that:

`...I don't believe that the lack of slashing by the shire is relevant. I think the community should be responsible for their own properties and survival. In the area in which we live fire preparation and prevention is paramount and should be everyone's responsibility.'

Evidently Mr. McKay and Ms. Martin devised their own evacuation plan which was as follows:

`...At the beginning of each fire season we would pack a suit case with valuables and documents which we would take this to my mothers place all summer.'

Although Mr. McKay also had an alternative plan in place. If he and his partner did not have sufficient time to evacuate they would go to a neighbour's vacant block. Apparently the neighbour, Max Cameron has a vacant block, which backed onto Seabreeze Avenue. This block is:

`...substantially cleared and actually backs onto Seabreeze Ave, directly across the road from our place. Max had a shed at the rear of his house with all the fire suppression systems in place and he had given us a key and showed us how to operate the system.'

However, Mr. McKay also considered that:

`...After 1983, I lost a bit of confidence in the C.F.A. They pushed the notion of staying in your house until the fire front passed and then get out and fight spot fires. Both Cheryl and I thought this was a ridiculous option and that in the area in which we live evacuation was the only thing to do. Being as prepared and organised as we were and so definite in our commitment to leave this in retrospect has probably saved our lives.'

Another witness, Ms. Wendy Saunders, a friend of Erin stated that she had a telephone conversation at 12.15pm in which:

> ***`...Genevieve appeared more concerned about the fires in Kalorama. Genevieve looked outside during our conversation. And told me that the fires on the Mount Dandenong side of the mountain appeared to be under control because there was a lot less smoke. She seemed unconcerned about any fires in her vicinity and couldn't smell or see any smoke. She indicated that the weather conditions were less threatening than the previous day. Her manner was calm.***
>
> ***I asked her what she planned to do if there was any fires in that area and she told me that she had or was intending to douse down the house with water and fill up the gutters. We talked about other preparations for remaining with the house. When I reflect back on the conversation, she must have been aware of the possibility that she may have had to evacuate. Although Genevieve didn't mention it she gave me the impression that evacuation was a possibility, this may have been advice given to her, the movements of other residents or the nature of the weather and the fact that fires had already broken out in the Dandenongs...'***

Mr. David Beaumont, another friend of Erin's stated that he had a conversation about fire preparedness when visiting her home in Seabreeze Avenue:

`...She intended to evacuate but added that if she was caught off guard and left with no other options that she had a next door neighbour who had said to her that she would be safe in their basement. She did elaborate on this a bit and said that the neighbour thought that this was safe place but I was not exactly sure of the set up or construction of this basement...'

Mr. Beaumont could not be sure as to whether the neighbour was at number 33 or 29.

Mr. Francis Deery from 26 Seabreeze Avenue saw Erin *`running along Seabreeze Avenue towards Corner Avenue...'* She was distressed. A short time later Deery observed both the Lindroth and Erin houses to have *`gone'*. Deery was present in the area when the fire hit the Seabreeze Avenue area and he and his wife managed to save their house. Deery's statement indicates some degree of confusion in scene management at Brigade level. Deery returned to the Dandenongs from his mother's place in Mornington after becoming aware of the fires. He avoided a police roadblock on a main road and managed to enter his property from an alternative route.

After arriving home, Mr. Deery commented that within ten minutes:

`....there were cinders coming over and started spot fires around our house, the spot fires at first were just gradual but they became more prevalent. My wife and I were both putting out spot fires. I was at the front and Coral was at the back with my son Wayne who was hosing down the back of the house...'

Mr. Deery also commented that in the early stages *`...we really hadn't made a decision whether to evacuate the house or not we were too busy putting out these spot fires.'* During Deery's movements around the area of Seabreeze Avenue he assisted CFA personnel with fire hoses and was told on a number of occasions not to go back towards his house. He managed to enter the property via a back route. Apparently the fire brigade told him to evacuate *`three times.'* As indicated Deery considered:

`...that the main reason we didn't evacuate was that our place didn't bear the full front of the fire and by staying we had a chance of saving the house by putting out the spot fires and I really feel that if we hadn't stayed, we would have lost the house.'

And, along with minor damage [3] to the house:

`...my wife and I didn't receive any lasting injuries, we just suffered the effects of smoke and soot in the eyes for a few days.'

Mr. Deery commented on the level of CFA information:

`...During the time we have lived in Seabreeze Avenue, we hadn't received any formal training in Fire Education. From time to time we received pamphlets in the letterbox. There are C.F.A ads on television and we know that we live in a bushfire prone area. We have never been to any public meetings to do with bushfires.'

---

[3] Estimated at $7000 (including plants).

In a different approach to Mr. McKay, Deery stated:

`...I don't think that in the time we have lived at Seabreeze Avenue the Council responsible for the area which is the Yarra Ranges Shire have done any clearing. The previous Council Sherbrooke Shire did regular burn offs to clear.'

Mr. Deery also commented on the house opposite his home. He would have blamed the owners of this house if his property had been destroyed. It was a holiday house and was destroyed in the fire. He described this house as:

`...as a very small log cabin, very run down in condition and very overgrown with undergrowth...'

Mr. Deery's house was a double storey brick, cape cod in style with an English style garden. His fire suppression equipment was made up of three garden hoses.

Mr. Kenneth Winn from 20 Seabreeze Avenue also made a statement. He and his wife lived in a brick veneer home with a garden of lawn, rhododendrons and azaleas. The fire suppression equipment consisted of a fire extinguisher and garden hoses. There was no sprinkler system. Mr. Winn, a licensed radio operator was listening to reports on the fires over the police channel and his wife was tuned into 3AW. He commented:

`...we had a pretty good idea of what was happening.'

Mr. Winn explained his family's fire preparation:

`...I filled all available baths basins and sinks with water and wet as many towels as possible. I laid out the hoses around my property so I would be prepared if I had to use then. I filled buckets with water and placed them strategically around the house. I placed the fire extinguisher in the upstairs manhole in case a fire started in the upstairs roof cavity. Myself and Cameron changed into suitable clothing and helped my wife pack the car in case she needed to leave quickly. I closed windows around the house and made sure that there was nothing up against the windows. I also put a rake and other tools around the property and a ladder up against the side of the house to gain access to the roof. I then just generally prepared as well as I could. I had made a conscious decision that I would remain with my house no matter what to protect my house and my eldest son was happy to remain...'

Mr. Winn explained that there were two boys next door and that their parents were at work. Eventually when the fire came close to the Winn's house his wife, youngest son, the boys next door and another neighbour evacuated in Winn's car. Winn was also concerned for the safety of his parents who lived in Mount View. During the fire fighting period the police were driving down Seaview:

`...warning residents to evacuate over their PA system in the police car...'

Mr. Winn summarised the fire fighting at his home thus:

`...Once the fire past through Seabreeze Avenue and past my property, only a couple of small grassed areas on my property actually caught alight. My son Cameron was able to put

these out fairly quickly from ground level as they became alight. I remained on my roof for almost the entire time as I felt I could see what was happening better from up there and I continued to hose the house from the roof.'

As far as fire education, Mr. Winn commented that he had lived in the area most of his life and been through *`Ash Wednesday'* and the 1962 fires:

> ***`...I consider that I am aware of what action to take and I have a reasonable knowledge of the dangers to be faced and what is to be done as preventative measures. I have been to a least two open days at the local Ferny Creek Fire Station and I have received general information on these days about preparing for bushfires and looking after your property. They have demonstrations on how to put fires out and general information concerning fire awareness and safety. The first time I went to one of these open days would have been two or three years ago. Residents are aware of these open days by letters and pamphlets and also in the local paper. We are also given information regarding fire safety through shire newsletters dropped into letter boxes.'***

After becoming aware of fires in the Ferny Creek area Mr. Rodney Lindroth, Graham's father, had difficulties getting in telephone contact with his son. The telephone was either engaged, rang out or reported by Telstra as having a problem on the line. Later in the afternoon Lindroth arrived in the *`Hills'* and the local fire refuge (the Horticultural Pavilion) but could not obtain access to the Seaview Avenue area. He was not worried at this time as he believed:

`...that they had been well prepared for such an incident.'

Mr. Lindroth detailed the level of fire preparedness at 29 Seabreeze (including details of the construction of the house/garage which will be considered later). He stated that after moving from a residential area such as East Bentleigh the family was:

`...not as aware of the dangers of bushfire initially but we quickly educated ourselves in this area'

Mr. and Mrs. Lindroth obtained a package of information from the CFA (after seeing an advertisement on television). After viewing the package they put a number of precautions in place including filling plastic drink bottles and positioning them on the roof. Water bottles were put in the garage. Also:

`...Under the balcony at the north western end of the house I had a plastic 200 litre container filled with water, I also placed buckets inside the tank, I placed the container and buckets in this location because there was also a water tank that held several thousand litres near the south western corner of the house, again so that I would have access to water.'

Earlier there was a pond in the garden however, at the time of the 1997 fires, the pond was no longer in use. Mr. Graham Lindroth knew of the precautions undertaken by the family. Apparently the understanding was for evacuation as a first priority:

> ***`...whilst the fire front passed through the area and then it was to return as quickly as possible in an effort to save the house. It was my understanding that if the house was to***

burn it would be as a result of the after effects of the fire passing through and not so much of the fire front. The preparations that we had made were firstly to evacuate but if an emergency arose we were to go into the garage and sit it out. In the case of being forced to stay whilst the fire front passed we were to dress in woollen clothing, fill the bath with water, close the curtains....'

Mr. Lindroth commented that the garage was the refuge because:

`...it was double brick with a concrete floor and ceiling, steel garage doors and it was the safest place on the property. I assumed that the area was fire safe, someone had told us that the door leading from the garage to the workshops rear had a fire rating, the door that we had installed from the office didn't because it was an internal door and there was no need. The other door leading to the rear yard was a steel door and was tightly sealed. I think that this door was rarely used as it had things stored in front of it. The garage tilt a door on the south eastern corner was a fairly tight fit but the one on the north eastern corner didn't quite close properly and would leave a gap of about one or two inches from the ground.'

Mr. Derek Covill, who owned the house up to 1987 when it was purchased by the Lindroths, stated:

`...The area under the house had been dug out in an `L' shape around the brick pillars. It had a door leading into the Garage which I assume was fire rated. I also assume that the concrete roof over the Garage was fire rated. I base those assumptions on my knowledge of building regulations.'

And:

`...I would not have called the area under the Loungeroom fire proof. I considered it a fire haven. I attended lectures in general fire safety in the hills being a bush environment and all the literature led me to believe that the garage was the safest place in the house to wait out the fire front.

When we purchased the house we were never told that the area under the Loungeroom was fire proof. To my belief that was never put forward as a selling point when we sold that house.'

The origins of the fire at Ferny Creek

An Investigation Team comprising officers from the Department of Natural Resources and Environment[4] and the Country Fire Authority[5] concluded that:

`As a result of examining the fire site, canvassing firefighters and local residents, and viewing television footage, the investigation team determined that this fire was ignited adjacent to Tobruk Avenue, Ferny Creek between 1230 and 1240 hrs on that day.'

---

4 Officers Paul Bolletta and Geoff Morsby.

5 Mr. Neil Barnes.

And that given:

> **`...all of the circumstances of the fire, it is probable that this fire was ignited as a result of human activity either by placing or discarding burning material at the site.'**

Although, the Investigation Team was also of the view, that there:

> **`...is a remote possibility that the fire may have been caused by hot metal fragments cast by a faulty exhaust on a passing vehicle, however there was no evidence to suggest that a vehicle had recently travelled over the slashed area.'**

The point of origin was Australian Map Grid Reference *`CU 525 074'* or more commonly known in *`Melways'* as *`Map Reference 65-J 10.'* Investigation revealed:

> ***`...the area of origin to be at a point south of Tobruk Avenue about 57 metres south-west of the locked fire access gate at the Mountain Highway junction and 24 metres from the south side of Tobruk Avenue road edge.***
>
> ***The south side of Tobruk Avenue has a 1.5 metre high batter and had been slashed by tractor to a southerly depth of about 21 metres from the road edge. The area of origin was determined to be within a zone measuring 1.2 metres in depth and 6 metres length.'***

After ignition the fire front spread:

> ***`...generally in a south-easterly direction up the slope towards Janesdell Avenue, Ferny Creek.***
>
> ***At various points the fire front shifted its direction of travel and on at least one occasion split into two fronts.***
>
> ***As each of the main fronts travelled up the slope, embers were cast ahead – starting new fires.***
>
> ***The west flanks spread outwards from the main run of the fire and in one location developed into a running fire which travelled generally up the slope towards the residential areas at the western end of Janesdell Avenue and Mount View Road.***
>
> ***The eastern flank spread outwards along the Mountain Highway and also developed into a running fire which ultimately travelled towards Alpine Road. This front flanked further eastward towards the eastern end of Alpine Road.***
>
> **It is not clear whether any of these fire fronts actually converged during the course of their travel up the slope.**
>
> **However it is clear from the burn and char patterns that the hottest sections of the fire were in the area immediately north-north-west of the western end of Janesdell and north of residences at 16 and 18 Mount View Road...'**

On Seabreeze Avenue the fire front continued in a `*...direct south line and exiting at the point where houses were lost at number 27 and 29 Seabreeze Avenue.'* Then the fire:

`...crested the ridge on the south side of Seabreeze Avenue where the topography and reduced fuel combined with suppression activity reduced the intensity and arrested further spread.'

In reviewing all of the circumstances of the fires, Arson Squad Police completing the brief for the coroner, concluded:

`The investigation teams have concluded that human activity was found to be the cause of all whether that activity was deliberate, negligent or accidental. The teams have allowed for the possibility that 4 of the 5 fires could have been caused by hot metal fragments being emitted from a passing vehicle although they do concede that this is highly unlikely. The location and timing of these fires cause the police investigation team to believe that they have been deliberately lit by a person or persons unknown. There is sufficient time between the fires for a single person to have lit all 5 of the fires but police haven't discounted a `copy cat' offender.'

The investigation into the fire destroying the house at 29 Seabreeze Avenue

The DNRE and CFA Investigation Team examined fire damage both to the grounds and building at 29 Seabreeze Avenue.

The significance of the Investigation is that it contains some indication of both the amount of and type of vegetation near to the house, which would tend to put the building at higher level of risk. Although it must be pointed out that, as a residence in the scenic area of the `*Dandenongs',* 29 Seabreeze Avenue was not unusual in this regard.

The Investigation Team reported that the fire travelled up sloping ground from Mount View Road to the vicinity of 29 Seabreeze Avenue which had:

> ***`....a stand of 30-40 eucalypts up to 30 m in height. The bark on all of these trees was burnt from ground level to tree top level. Leaves in the canopy were also burnt, but still attached to the trees. Fire damage to the bark was generally light. Heavier burning with some alligatoring was evident on the bark of trees within 6 m of the house, particularly on the south eastern side of the house. Tree ferns approximately 2m in height and standing within 4 m of the house showed signs of burning along the full length of the trunks. Fronds were also burnt, but still small leaf material remained attached.***

Most small to medium shrubs on the property showed blackened bark and burnt leaves, but most small branches were not consumed by fire and leaves were still attached to the branches. Leaves were frozen on branches indicating the travel of the fire to be in a generally south westerly direction. Fire damage up into trees beyond the property did not extend any more than 30 m to the south across Seabreeze Avenue. The fire travelled on the ground into grass on neighbouring properties. Along the western side of the property up to 10 m from the fence line, fire damage was minimal. Light branches and leaves were still attached to shrubs. A collection of 50-60 125 mm plastic pots containing plants was largely undamaged by heat, with the plastic in only a few pots being melted or distorted.

A number of off cuts log sections from tree trunks approximately 30-40 cm in diameter were located on the ground in the garden within 10 m of the house. Where these were fire affected, damage was generally limited to burning of the outer bark, with alligatoring visible on only a few pieces. Many log off cuts on the northern side of the house were unburnt on some surfaces, particularly the south facing surface.'

And, significantly fire damage:

`...was less severe in the grounds on the western side of the property and into adjoining land at 27 Seabreeze Avenue which contained short mown grass and shrubs to a height of 3-5m. These shrubs sustained minimal damage. Fire in the adjoining property to the east at 31 Seabreeze Avenue to did not reach tree top height. Tree trunks exposed to fire showed blackening of bark to heights between 3-6 metres on the north facing surfaces.'

The house at 29 Seabreeze Avenue was extensively damaged by the fire. The external walls remained in place with the roof destroyed. The Investigation Team concluded that, as far as the external damage was concerned:

`...Few remains of framing timbers were evident. Most of the brick wall on the northern side of the house showed no carbon deposits from the fire. There were significant smoke deposits above the openings to the double garage on the eastern side of the house. Some smoke deposits were also evident on external walls on the western end of the house. Much of the brickwork between windows and door openings was damaged or had collapsed.'

The internal fire damage was extensive:

`...In the central section of the house, which was supported on brick piers, almost none of the framing timber, flooring or ceiling materials remained. Most of the combustible materials in this section of the house, which included bedrooms, bathroom and laundry were consumed in the fire. Materials from this section of the house fell to ground level underneath the brick piers. Some smoke deposits were found in corners of brickwork at the lowest levels at ground level.'

Examples of the extent of the damage can be found in the Investigators' report of what was remaining in the main bedroom. The bedroom contained:

`...some partially intact timber framing material less than one metre in length. Timber hearers were burnt completely from the tops of concrete stumps. Aluminium framed windows melted and glass had melted outwards.'

The garage, where the remains of Mr. and Mrs. Lindroth and Ms. Erin were found, was extensively fire effected.

`...Two motor vehicles, a lathe, an electric band saw and other equipment were extensively fire damaged. Viewed from the outside, the left garage showed signs of a hotter fire that the right side. The garage door was extensively heat affected and the electric steel door-opening track was buckled. With the exception of small areas in some corners, smoke residue in the garage was minimal. An unburnt towel was still in place where it had been placed under the tilt a door on the right garage. Brickwork above the window opening to an office in front of the garage and to a doorway leading outside the house had partially

collapsed. A steel brownbuilt cupboard next to the office window opening was severely heat affected from a height of about 70 cm above floor level.'

The Investigators identified three alternative seats of fire in the house. However it could not be established precisely when each fire started and the relationship between each seat. The seats of fire were firstly, in the central section of the house (lounge, dining, bedrooms and bathroom); secondly the garage and finally the main bedroom.

The Investigators concluded that destruction of the house was *`...consistent with damage arising from the bushfire, but the cause of the house fire cannot be determined.'* To explain the latter comment on *`cause'* the Investigators pointed to the fact that it was possible:

> ***`...that the fire occurred as a result of either direct impingement of flame as the fire front came in contact with the house, or as a result of ember attack ahead of the fire. Either would have been possible under conditions which prevailed at the time.'***

Significantly, the Investigators considered that:

> ***`...The most likely cause of the fire is as a result of burning embers carried ahead of the main fire. This would be consistent with other indicators such as the minimal damage to plastic pot plant containers and the light intensity burning on many of the shrubs and ferns close to the house. A timber decked verandah attached to the northern side of the house would have provided a combustible base for any embers which lodged on it.'***

The details of the history, construction and alterations to 29 Seabreeze Avenue are provide in a summary to the Police Arson Squad brief [6] :

> ***`The front of the house faces Seabreeze Avenue, with the driveway leading to the garage situated on the right hand side of the property. The rear of the building faced heavy foliage, which slopes downward to the rear of the Winn's property in Mount View Road. The rear of the lounge room, which faced the approaching fire, was mainly constructed from floor to ceiling glass. This was an addition to the original building with the enclosed glass area extending from the rear of the lounge room. This was added during the period of ownership by Derek COVILL and no other structural changes were carried out on the premises during their period of ownership.***
>
> ***Derek and Margaretha COVILL purchased the property from Harold and Thelma CHATFIELD in 1974. Derek COVILL states that the area underneath the verandah was enclosed with green fibreglass sheeting and there was no access into the garage from this area. He further states that the area underneath the house had been dug out in an `L' shape. This had a door to the garage which he believed was fire rated. He also believed that the concrete garage roof was also fire rated. COVILL further stated that the area underneath the house had never been put forward as fire proof when he purchased the***

---

6 Prepared jointly by the *`Operation Hudson Investigation Team'* - Detective Senior Sergeants Adrian Edwards and Colin Brockwell, Detective Senior Constable Robert Mitchelmore, Detective Senior Constables Alex Pratt, Peter Seiz, Darren Dean and Michael Corridan. See also comments of Messrs Lindroth and Covill under the sub heading *`The Circumstances.'*

property or when he sold the property. Derek COVILL recalls attending a lecture after the Ash Wednesday bush fires where he was told that the area he lived in was the highest fire rated area in the Mt. Dandenong area.

The property was purchased from the COVILL'S in March 1987, by Rodney and Lynette Lindroth. They moved into the premises in May 1987 with their only son Graham Kingsley Lindroth (deceased). During Rod Lindroth's period of ownership he added another bedroom to the Western end of the house and converted the original master bedroom into a games room. A potting room attached to the north east corner of the house was converted into an office by lining the interior, adding a door to the garage and installing an internal staircase. There were external windows on the north east and north west corners of the room. (These windows would have been in the direct path of the impending fire). These additions were carried out by builders Ian BEAZLEY and Ron WATSON and were approved by council.'

The lack of early warning and level of destruction in the fire

Seabreeze Avenue and Mountview Road are part of the Urban Forest Interface which are on the fringe of the Dandenong Ranges National Park, managed by the Department of Natural Resources and Environment.

The Police Arson Squad brief summarised the problem for the residents in the Mount View, Seabreeze Avenue areas, in view of the rapid onset of the fire:

`...This fire progressed into the...streets without any warning. Most of the residents who were interviewed didn't know that there was a fire in that area until it was burning around their homes. Some criticism has been laid relating to the lack of warning of the impending fire however this fire was burning through Mount View Road well before the arrival of the C.F.A and police. The speed of this fire made forewarning impossible.'

A number of houses were destroyed in the Ferny Creek fire. The list was summarised in the Police Arson Squad brief:

`Janesdell Avenue: numbers 2, 6, 8 and 10 destroyed.
Mount Erin Road: number 18 destroyed and numbers 14 and 16 damaged.
Mountview Road: numbers 11, 13, 14, 15, 16, 17, 18-20, 22, 24, 26 and 28 destroyed and numbers 3, 5, 7, 9, 12 and 14 damaged.
Seabreeze Avenue: numbers 23, 27, 29, 31, 32 and 33 destroyed and numbers 19, 24,25,26,28,35,36,37 and 39 damaged.
Alpine Road: numbers 9, 13, 16 and lot 96 destroyed and numbers 10-12...and 14 damaged.
Highview Road: numbers 1, 2, 6 and 10 destroyed and numbers 8, 12, and 14 damaged.
Merimbula Road: numbers 6, 11 and 17 destroyed and numbers 3, 9, 13 and 15 damaged.
Oberon Avenue: number 8 damaged.
Titania Terrace: number 2 damaged.'

It is noted that considerable fire suppression resources were committed to the Ferny Creek incident during the day. The Arson Squad summary states that the resources were:

`...I06 C.F.A Tankers and other appliances, 1 D.N.R.E Tanker, 1 D.N.R.E Slip on, 1 M.C.U. I Group Control Unit, 2 Bulldozers and 4 Aircraft.'

Conclusion

The Ferny Creek fire was deliberately lit. At this stage the identity of the person or persons involved is unknown.

It is likely that both Mr. and Mrs. Lindroth and Ms. Erin took shelter in the garage area, mistakenly believing it was relatively safe from fire. The three were sheltering in an area where they could not observe progress of the fire front and any fire development around the house. Thus they were not in the best position in the building to act to save the both the house and themselves. The fire which destroyed the house probably came from early ember attack and developed to engulf 29 Seabreeze Avenue after the front had passed.

Clearly Mr. and Mrs Lindroth and Ms. Erin had insufficient warning of the rapidly developing *`wildfire'* in the area of Mount View and Seaview Avenue. Their deaths illustrate but some of the difficulties associated with members of the public who do not have adequate experience, understanding and training remaining in a position of high risk in a rapidly developing *`wildfire'*. In these circumstances any use of *`fire refuge'* rooms within a building must be seriously questioned.

Contribution to the fire at Ferny Creek and the deaths

The identity of the person (or persons) who lit the fire at Ferny Creek is unknown. Thus the identity of the person who contributed to the deaths of Graham Lindroth, Jennifer Lindroth and Genevieve Erin is also unknown.

Because of similarities in the location where the Ferny Creek fire and the other fires in the Dandenong Ranges started it is possible that all of the fires were lit by the same person.

Findings on the Upwey/Walbundry Avenue fire

Origins of the fire at Upwey

The fire at Upwey commenced at about 12.35pm on 21st January in the area of Walbundry Avenue, Ferntree Gully then rapidly spread into Upwey.

The Arson Squad brief for the Coroner summarised the circumstances of the fire as:

> ***`...The fire burnt through public land crossing the Mt. Dandenong Tourist Road 3 times and continued into residential areas of Upwey at Hughes Road, Dealbata Road, Olivette Avenue, Jones Avenue, Irene Avenue, Bellbrook Road, The Highway and Janesleigh Road destroying 5 homes and damaging numerous others. This fire burnt through approximately 192 hectares of public land within the Ferntree Gully National Park.***
>
> ***The initial deployment of firefighting resources were hampered by the extreme fire behaviour making direct attack on the head and flanks dangerous. The Ferny Creek and Kalorama fires were well established at this stage and many fire sightings created***

confusion. Fears for the fire spreading to the Upwey residential area were well founded and planning began for this eventuality. Bombing aircraft were used very effectively to reduce flame heights and intensities to allow ground crews to save many houses...'

The investigatory team [7] **concluded:**

`...The precise point of origin could not be determined – due in part to the aggressive fire suppression tactics used in the area. No ignition sources were found.

...Given all of the circumstances, it is possible that the fire was caused by a person placing or discarding burning material at the site or by hot metal fragments cast by a faulty exhaust on a passing vehicle.'

As already noted in reviewing all of the circumstances of the fires, Arson Squad Police completing the brief for the coroner, concluded:

`The investigation teams have concluded that human activity was found to be the cause of all whether that activity was deliberate, negligent or accidental. The teams have allowed for the possibility that 4 of the 5 fires could have been caused by hot metal fragments being emitted from a passing vehicle although they do concede that this is highly unlikely. The location and timing of these fires cause the police investigation team to believe that they have been deliberately lit by a person or persons unknown. There is sufficient time between the fires for a single person to have lit all 5 of the fires but police haven't discounted a `copy cat' offender.'

The police brief summarised the damage was caused as a result of this fire

`Hughes Road: numbers 53, 57, 59 and 66 damaged.
Dealbata Road: number 35 destroyed and numbers 37 and 39 damaged.
Olivette Avenue: number 16 destroyed.
Jones Avenue: number 18 destroyed and numbers 6 and 21 damaged.
Irene Avenue: Number 1 destroyed.
Bellbrook Road: numbers 19, 27 and 29 damaged.
The Highway: number 5 destroyed.'

Contribution to the fire at Upwey

The identity of the person (or persons) who lit the fire at Upwey is unknown.

Because of similarities in the location where the Upwey fire and the other fires in the Dandenong Ranges started it is possible that all of the fires were lit by the same person.

Findings on the fire at Kalorama

[7] DNRE Officers Paul Bolleta and Geoff Morsby and CFA Officer Neil Barnes.

Origins of the fire at Kalorama

The fire at Kalorama commenced at about 10.44am on 21st January off an unnamed track in the vicinity of Inverness Road and the Mount Dandenong Tourist Road, Montrose.

The Arson Squad brief for the Coroner summarised the circumstances of the Kalorama fire as burning:

> ***`...approximately 29 hectares burning through public land between the Mt Dandenong Tourist Road and Jasper Road, Kalorama. From the area of origin adjacent to the unnamed track, the fire front travelled in a south-east direction up the slope in a westerly and northerly direction. It progressed through to Scenic Crescent, William Street, Hands Road, northerly direction. Thompsons Road and Jasper Road which are all residential streets situated within the urban-forest interface. This fire was controlled at 5.20pm and contained at 8.40pm after which black out operations continued...'***

The investigatory team [8] **concluded:**

> ***`...the precise point of origin for this fire cannot be determined. However the team believes that the approximate area of origin is within three (3) metres of the northwest corner of the `elbow'.***
>
> ***...There is a remote possibility that the fire was caused by a metal fragment from the faulty exhaust or faulty brakes of a passing vehicle. Given that the area of origin has been disturbed by the suppression activity, the use of an incendiary device cannot be discounted. The other known sources of ignition are considered highly improbable.***
>
> ***...It may be reasonable to draw an inference that the fire resulted from human intervention through some placed or discarded material...'***

As noted in reviewing all of the circumstances of the fires, Arson Squad Police completing the brief for the coroner, concluded:

> **`The investigation teams have concluded that human activity was found to be the cause of all whether that activity was deliberate, negligent or accidental. The teams have allowed for the possibility that 4 of the 5 fires could have been caused by hot metal fragments being emitted from a passing vehicle although they do concede that this is highly unlikely. The location and timing of these fires cause the police investigation team to believe that they have been deliberately lit by a person or persons unknown. There is sufficient time between the fires for a single person to have lit all 5 of the fires but police haven't discounted a `copy cat' offender.'**

The police brief summarised the damage in the Kalorama fire as:

> ***`Scenic Crescent: number 20 destroyed and numbers 15, 19 and 22 damaged. William Street: numbers 8. 9, 10 and 12 damaged.***

---

[8] DNRE Officers Nick Walton and Chris Marshall and CFA Fire Officer Peter Merrick.

Hands Road: numbers 13-15 and 16 destroyed and numbers 9, 10, 11, 12 and 14 damaged.'

Contribution to the fire at Kalorama

The identity of the person (or persons) who lit the fire at Kalorama is unknown.

Because of similarities in the location where the Kalorama fire and the other fires in the Dandenong Ranges started it is possible that all of the fires were lit by the same person.

Findings on the Fussell Road, Montrose fire

Origins of the fire at Fussell Road

The fire at Montrose commenced at about 10.20am on 21st January on vacant land owned by Boral Quarries in Fussell Road.

The Arson Squad brief for the Coroner identified the area where the fire occurred:

`...Fussell Road is a bitumen and gravel road which terminates at the driveway to a house on the property owned by Boral Quarries. The fire occurred on the north side of that driveway. This was a relatively small fire which was contained at about 11.l2am. This fire did not cause any damage to or pose any risk to private property.'

The Fire Investigators [9] **concluded:**

`...The precise point of origin for this fire cannot he determined. However, the team believes that the area of origin is within two (2) meters of the southeast corner of the burnt area.

...There is a remote possibility that the fire was caused by a metal fragment from a faulty exhaust or faulty brakes of a passing vehicle. Given that the area of origin has been disturbed by the suppression activity, the use of an incendiary device cannot be discounted. The other known sources of ignition are considered improbable.

...It may be reasonable to draw an inference that the fire resulted from human intervention through some placed or discarded material...'

As noted in the other fires, in reviewing all of the circumstances of the fires, Arson Squad Police completing the brief for the coroner, concluded:

`The investigation teams have concluded that human activity was found to be the cause of all whether that activity was deliberate, negligent or accidental. The teams have allowed for the possibility that 4 of the 5 fires could have been caused by hot metal fragments being emitted from a passing vehicle although they do concede that this is highly unlikely. The location and timing of these fires cause the police investigation team to believe that they have

9 DNRE Officers Nick Walton and Chris Marshall and CFA Fire Officer Peter Merrick.

been deliberately lit by a person or persons unknown. There is sufficient time between the fires for a single person to have lit all 5 of the fires but police haven't discounted a `copy cat' offender.'

Contribution to the fire at Montrose

The identity of the person (or persons) who lit the fire at Montrose is unknown.

Because of similarities in the location where the Montrose fire and the other fires in the Dandenong Ranges started it is possible that all of the fires were lit by the same person.

Findings on the Trig Track, Mount Dandenong fire

Origins of the fire at Trig Track

The fire at Mount Dandenong commenced at about 11.01am on 21st January near the Trig Track in the vicinity of the Sky High Restaurant.

The Arson Squad brief for the Coroner identified the area where the fire occurred:

> ***`...This fire occurred approximately 50 metres below Trig Track, Mount Dandenong beside a very steep walking track which links Trig Track and the Fireline Track. It burnt through approximately 10 hectares of public bush land up hill crossing Trig Track and continuing on until it reached the grassed area at the Mount Dandenong Observatory Car Park where it's forward spread was stopped. No property was threatened or lost as a result or this fire.'***

The Fire Investigators[10] **concluded:**

> ***`...The precise point of origin for this fire cannot he determined. However the team believes that the approximate area of origin is within three (3) metres on the eastern side of the walking track which links Trig Track and Fireline Track.***
>
> ***It may be reasonable to draw an inference that the fire resulted from human intervention through some placed or discarded material...'***

As noted by Arson Squad Police when completing the brief for the coroner:

`The investigation teams have concluded that human activity was found to be the cause of all whether that activity was deliberate, negligent or accidental. The teams have allowed for the possibility that 4 of the 5 fires could have been caused by hot metal fragments being emitted from a passing vehicle although they do concede that this is highly unlikely. The location and timing of these fires cause the police investigation team to believe that they have been deliberately lit by a person or persons unknown. There is sufficient time between the fires for a single person to have lit all 5 of the fires but police haven't discounted a `copy cat' offender.'

---

[10] Walton, Marshall and Merrick.

Contribution to the fire at Trig Track, Mount Dandenong

The identity of the person (or persons) who lit the fire at Trig Track is unknown.

Because of similarities in the location where the Trig Track fire and the other fires in the Dandenong Ranges started it is possible that all of the fires were lit by the same person.

Recommendations and Comments on the fires

I propose to forward the Findings, Recommendations and Comments to the Attorney General as a matter of information. I will also send the Findings to the:

- **Minister, Department of Justice,**
- **Minister for Local Government,**
- **Chief Commissioner of Police,**
- **Chairman, Country Fire Authority,**
- **Chief Executive Officer, Department of Natural Resources and Environment,**
- **Chairman, Australian Fire Authorities Council,**
- **Chairman, Emergency Management Australia,**
- **Secretary, Shire of Yarra Ranges,**
- **Chief Executive Officer, Yarra Valley Water,**
- **Chief Executive Officer, Melbourne Fire and Emergency Services Board,**
- **Chief Executive Officer, State Emergency Service**
- **Secretary, United Firefighters Union of Australia,**
- **Chief Executive Officer, Telstra Corporation Limited,**
- **Chief Executive Officer, Insurance Council of Australia**
- **Chief Executive Officer, Standards Australia,**
- **Chief Executive Officer, Victorian Workcover Authority, and**
- **The Director, Monash University Accident Research Centre.**

Introduction – learning from the fires

The 1997 Dandenong fires have identified a significant number of changes that are needed.

Areas that should be targeted for improvement are command and control, [11] communications, training of the emergency services, cooperation between agencies, the management of community risk and evacuation, early fire warning, access roads, vegetation clearance, water supply, road block control, response times for fire agencies in the rural/urban interface, adoption of new Australian Standards to name but a few.

---

11 See Appendix 3, CFA Submission on *`Communications and Control'* for detail on areas targeted for improvements.

Positively, following the fires, a number of agencies have provided reviews of the incidents with a view to learning from the events of 20th and 21st January 1997. The Country Fire Authority and Department of Natural Resources and Environment undertook an in depth review of all of the fires and examined procedures in the *WOPER* Report. [12] **In September 1997 both the Department of Natural Resources and Environment and the CFA undertook a joint, detailed review of procedures by way of the Fire Agencies Improved Initiatives Final Report (FAII).**

After the inquests the CFA and DNRE presented separate and detailed submissions. So too did the Shire of Yarra Ranges. The United Firefighters Union of Australia (Victorian Branch) presented a submission. A submission was received from radio station 3AW. A number of individuals also made submissions. [13]

The Telstra Corporation Limited also presented a submission following the inquests dealing with its responsibilities to the Community (and that of the industry generally) in the event of an emergency such as the fires in the Dandenongs.

The various reports and reviews following the fires and inquests provide all of the agencies and policy makers the opportunity to reassess the level of community education, knowledge and understanding of fire and its risks. They provide a potential for the community to contribute to new directions in fire safety. Also the various agencies have the opportunity to audit their policies, procedures, training, equipment and response. More significantly, an effective audit by all of the agencies will, no doubt, identify areas of improvement in overall management that will inevitably save lives, reduce injuries and property damage.

The material and submission presented during the inquest evidence a significant level of inter-agency cooperation in the management of the fires and the aftermath. In summary the CFA submission states that for the most part:

> **`*...the evidence was to the effect that these relationships were constructive and resulted in an enhanced level of protection to the Dandenong Ranges community.'***

Enhanced levels of cooperation can only assist in reducing the risk to the community both before and after an event such as the fires. The sheer magnitude of such a disaster means that no one agency or association will have the resources (or knowledge) to effectively manage all of the issues that may arise. Following such an event the lessons learnt will inevitably be both multi-disciplinary and multi-agency. The CFA submission suggests that:

---

12 Note: There are a large number of recommendations in the WOPER Report dealing with problems in the areas where the fires occurred.

13 John Irving; Norman Endacott; A.R.Toyne; Dr. Tim Humphery; Alojz Kastelic; Paul Phelan.

> ***`...any problems experienced in areas such as the flow of information between agencies have been explored as part of a wide ranging debriefing process and, where necessary, new or revised inter-agency protocols have been prepared and implemented.'***

Although, the CFA submission also commented:

> ***`...The co-operative process engaged in by most of the agencies involved was less evident in dealings with Telstra but it appears that most of those difficulties will be ironed out in the near future.'*** **14**

DNRE commented that one example of cooperation was the joint CFA/DNRE *`FAII'* Project which was a major performance evaluation following the 1997/98 fires. Following that review *`...comprehensive agreement was reached on a united way forward...'* and:

> ***`...The primary objectives of the FAII project were to create a safer community and to protect our natural assets. As a result of the improvements in the way we do things, we recognise that there are benefits for our people in terms of safety and efficiency.***
>
> ***While there is nothing new about firefighting cooperation between CFA and NRE, this new suite of improvements demonstrated a progressive change in the cultures of the two organisations, signalling an even greater willingness to work together at all levels of fire prevention, preparedness and response.***
>
> ***Many of the improvements identified have brought the two Agencies even closer across the range of their activities – prevention, preparedness, operations, incident management, communications and occupational health and safety...'***

This developing cooperative approach by all agencies (whether public or private) potentially involved in the management of areas of major risk in our community and following a disaster is to be commended. It should be enhanced at all opportunities. The breaking down of all inter-agency and organisational barriers in the management of risk and disaster makes sense if the community is to receive the full benefits of all-available expertise and resources. The standardisation of practices, procedures and equipment (where practicable) needs to be encouraged.

All of the reports and submissions of the main agencies and organisations provided a large number of practical and sensible recommendations and improvements in protocols and procedures.[15] Obviously, the agencies need appropriate levels of support to enable the introduction of any new or improved initiatives that lead to improvements in the management of major incidents such as the 1997 Dandenong fires. Where those potential improvements are demonstrated to have an effect on saving lives, or reducing injury and property damage

---

14 It also appears that there has been some admitted historical tension between the CFA and MFESB which *`has dissipated to a great extent...' (*See CFA submission p.87) Other areas of difficulty included the Victoria Police (communications/roadblocks); the Water Authority (contamination with the use of water bombing aircraft and replenishing of supply); the electricity authority was concerned about its representatives getting through roadblocks (this also applied to the Water Authority). (See generally the CFA submission pps. 87-89)

15 See Appendix 1 for a list of all of the recommendations of the various agencies.

support is required. No doubt, many of the recommendations will have the added benefits of improved disaster management and reducing unnecessary trauma to individuals and the community.

It is not considered to be the Coroner's role to critically examine in detail all of the various agency recommendations contained in the reports and submissions.

However, there are some significant areas in which coronial recommendations will be made. Generally, the coronial recommendations should not be viewed as necessarily being critical of any particular agency's response to the fires but as an enhancement to the work already being done. Nor should coronial recommendations be viewed as covering the field as, following the experience of the 1997 fires, there is evidence of a considerable amount of work yet to be undertaken to improve overall systems. No doubt since this event some of this work has already been completed.

As there are a considerable number of recommendations or suggestions from a variety of agencies, organisations and individuals it would be desirable to establish a process to compile, review, prioritise and assist in implementing any recommendations that have not been implemented. Innovative ways of managing risk may also need to be explored.

Any process to consider the recommendations would, no doubt, need representation from all relevant agencies and organisations.

Recommendation 1

The Department of Justice auspice a review of the various recommendations that have been developed by a number of agencies following the investigations into the fires in Victoria in January 1997 (and in particular those following the deaths and fires in the Dandenong Ranges) with a view to adopting (where practicable) the recommendations.

A number of agencies should be involved in the review. These would include CFA, DNRE, MFESB, Victoria Police, SES, Local Government (and the Shire of Yarra Ranges), Telstra (and other telecommunication carriers), representatives from Water, Electricity and Gas Utilities, United Firefighters Union, etc.

The review should also consider the comments/criticisms of the various witnesses and individuals that made submissions to the Coronial Inquiry.

Significant areas of concern about management of the Dandenong fires

As indicated, in any significant community disaster there will be a number of issues raised that provide an opportunity for learning. The Dandenong fires are no exception. Following the level of preparedness of the authorities for what was understood to be a high risk season in the summer of 1997/98 a number of the issues raised during 1997 may well have been addressed.

The Arson Squad brief prepared for the Coroner raises a number of *`Areas of Concern'* gleaned during the police investigation from the large number of witnesses interviewed.*16* Witnesses during the running of these inquests expressed similar concerns. Concerns raised varied from inadequate roadside slashing, early warning of fire to road-blocks, inaccessible streets, problems with hydrant adaptors and water supply. The witness summaries in the Arson Squad brief *17*provide useful examples of where systems management failed or, in some cases, succeeded. One issue that clearly requires addressing is that of <u>early warning to residents</u> in areas of particularly high risk in a general area of high fire risk (ie: the Seabreeze Avenue/Mount View Road vicinity). *18*

Each of the concerns mentioned in the police summary *`Areas of Concern'* raise serious issues for all of the agencies assisting in the management of a major *`wildfire'* in the urban/rural interface.

Significantly, a similar range of issues can also be seen in a Coroner's inquest into a major fire at Warrandyte on 25th February 1991. *19* It is concerning that not dissimilar issues have been raised in relation to the management of the Dandenong fires some six years later in 1997. The Deputy Coroner commented generally about the problems in her findings on the Warrandyte fires:

> ***`Many of these problems have been discussed at differing levels including residents' meetings, Shire and Council meetings, and by way of communication between various authorities. In some cases explanations have been provided which have satisfied the original concern, in other cases steps have been taken to remedy problems encountered and to try to prevent their recurrence, and with other problems, there is no clear cut solution, only the hope that a balance of interest will be struck in trying to find a solution.***
>
> ***To some extent, the inquest has provided a forum for explanation and communication, and this finding might assist in the further development of improved strategies for the future.'***

---

16 See Appendix 2 for the summary of the Arson Squad's notes of the various *`Areas of Concern.'*

17 See Dandenong Ranges Fires, brief in Coroners' Case No. 1677/*98 `Witness list and summary of statements chronological.'*

18 Although in Ferny Creek there may not have been sufficient time in view of the rapid spread of the fire.

19 Finding of Deputy Coroner Wendy Wilmoth attached (Appendix 4).

The Deputy Coroner also points to the comments of Bushfire Review Committee, (Miller Report) following the Ash Wednesday Fires in February 1983 on the issue of high fuel levels in semi-rural areas:

`...Communities, often commuter-oriented, have chosen to live cheek by jowl with an enormously hostile and dangerous fire environment. Often, dwellings are left vacant by day as man and wife go out to work, or a wife and small children might be left on their own. The risk to life and property does not end there...[M]any such communities have no background of living in the bush and are generally unused to fending for themselves under fire conditions. Additionally, some of those with an interest in preserving the environment resist measures designed to reduce hazards. However, perhaps worst of all, the fire-fighting problem in these areas, where high fuel levels and relatively crowded populations co-exist, is probably the most difficult of all to manage.'

The Deputy Coroner's (and the Miller Report) comments could equally apply to the experience of the fires in the Dandenong Ranges on 21st January.

Whilst it is not considered appropriate to traverse all of the communities' concerns about the Dandenong fires some are the subject of comment in these findings into the fires. Briefly, some of the issues summarised in the Arson Squad brief cover (by way of example only) are:

Roadside slashing

`...Many of the residents living in the Mt Dandenong Ranges area are critical of the lack of roadside slashing by the Shire of Yarra Ranges prior to the 21st of January 1997. Some say that roadside slashing has not been carried out as often since the amalgamation of the councils.'

Clearance of private land

`...Some C.F.A. personnel and residents complained that there wasn't enough done by some residents to clear private land. Concerns were also raised about the lack of enforcement by the Shire of Yarra Ranges and the time lapse between the issue of notices and the follow up enforcement for non compliance.'

Hydrant adaptors

`...Many of the C.F.A strike teams were not equipped with the hydrant adaptors needed to access hydrants fitted with M.F.B thread. Some of the fire hydrants in the area of the fires were M.F.B hydrants. The fire hydrants in the M.F.B areas of responsibility have a different thread than the hydrants in the C.F.A areas of responsibility. Some of the country strike teams didn't have the adaptor needed so that they could fill their tankers with water.'

Road-blocks

`...A lot of residents complained about the lack of initiative by the police whilst conducting road blocks. Many were stopped from returning to their homes by the police and they feel

that it should be their decision whether or not they return to their homes to remove possessions or defend it from fire.

Some road blocks were set up at local level, the locations of which were not communicated to the Command Centre.

Some emergency service personnel travelling in private vehicles were stopped by police at roadblocks where in some instances heated arguments developed.'

Water pressure

`...A number of the C.F.A members complained of the lack of or very low water pressure in the One Tree Hill and Upwey areas.'

Fire Refuges and Emergency Shelters

> ***`...Many residents were unsure of the location of the emergency shelters and relief centres. There is a lot of confusion in relation to what a fire refuge is and what an emergency shelter is. Many residents self evacuated to locations that were not designated evacuation centres which placed them at risk as no police or other support agencies knew that they were there and therefore could not assist or register same.'***

The responsibility of the Community and emergency agencies for fire safety

Historically, the Australian Community has always faced *`wildfire'* in the bush environment. This will not change. With the increasing desire of individuals to live in places of rural and bush beauty (such as the Dandenong Ranges) the ever-present risk of fire must be managed. Fire management will invariably need to be balanced with the competing requirement of environmental controls.

Because of the sheer magnitude and potential for widespread destruction of *`wildfire'* the management of its risks has to be both a community and government/semi government agency responsibility.

The CFA's philosophy is summarised in its submission as focussing:

> ***`...much more and (sic) community involvement and risk management...'***

This approach has followed the 1994 *`Senate Standing Committee on Industry, Science, Technology, Communications and Infrastructure - Report on Disaster Management.'* The CFA comments that, despite perceptions to the contrary, it:

> ***`...is not part of the CFA's approach to community empowerment to advocate that people stay with their homes during a bushfire. This is just one of the options promoted by the CFA. Awareness and understanding of the options available is the key to survival.'***

However, as has been observed by the deaths in Seabreeze Avenue, Ferny Creek and the evidence of a number of surviving witnesses - there may well be significant problems in the area of community awareness. These problems appear to be about individual awareness of the correct action to take in the event of *`wildfire'*. The comment by the CFA in its submission:

> ***`...The evidence of residents is, at best, anecdotal. However, it does provide some useful insights into how individuals respond to the dangers of bushfires. The role of education in shaping that response and some of the difficulties organisations like the CFA have faced and will continue to face in promoting the importance of that education process.'***

The CFA submission examines four groups of residents; the largest group being those who evacuated late; the next largest who stayed and defended their homes; two residents who evacuated early; and finally the Lindroths/Erin. The submission comments that the:

> ***`...number of residents evacuating late is a cause for concern. On the other hand, it was heartening to see the extent of preparedness of those residents who had taken the trouble to heed the CFA message on bushfire survival.'***

Yet, examining the evidence of the witnesses who survived may also raise cause for concern. Survival may well have depended on the level of severity of the fire and its direction. Had the intensity of the fire been worse the result may have been different. With most residents, the level of preparedness did not reach that of Mr. Cameron [20] generally there was a reliance on a limited number of *`garden hoses'* and little indication of independent water supply. For a resident to successfully fight a fire from his/her own home will also depend on a number of factors including early warning, knowledge and understanding of fire behaviour; level of mobility, fitness and health; ability to handle pressure; assistance from other members of the household; surrounding factors including the condition of near neighbours' gardens.

Generally, it appears that none of the property owners had a detailed professional *`risk assessment'* made on their property. Where lives are at risk in an area of high fire risk (such as the Dandenong Ranges) it would seem that this step would be the minimum action of the practical and concerned property owner. It would be money well spent in view of the potential risk to life and total destruction the most significant investment that nearly all members of the community would make in their lifetime (the home and its contents).

---

20 See comments under the sub heading *`Community based (or local) fire suppression systems.'*

As indicated there are conflicting views of the efficacy of the CFA/DNRE's approach to community fire safety in the sense of encouraging individuals to assess the benefits of remaining with their homes and conducting active suppression activities during `wildfires.' It will be recalled that one witness, Mr. McKay, considered that:

> **`...After 1983, I lost a bit of confidence in the C.F.A. They pushed the notion of staying in your house until the fire front passed and then get out and fight spot fires. Both Cheryl and I thought this was a ridiculous option and that in the area in which we live evacuation was the only thing to do. Being as prepared and organised as we were and so definite in our commitment to leave this in retrospect has probably saved our lives.'**

Also the Arson Squad, in its summary *`Areas of Concern'* for the Coroner's brief, comments on the issue of evacuation:

> ***`...There is confusion amongst most residents whether they should evacuate or stay with their homes during a fire. There doesn't seem to be a clear-cut policy in relation to evacuation. Some residents showed concern relating to the lack of accurate information as to where the fires were burning so that they could make an informed decision where to evacuate to and what roads were safe to use as an appropriate escape route.'***

However, it is noted that the CFA has based its philosophy on research conducted by the CSIRO which, according to one CFA witness Mr. Boura, states:

> ***`...that if a building is properly designed, constructed and sited and the surroundings suitably landscaped, the building itself is likely to provide shelter from a bushfire for the period of the fire, which in most cases is less than 30 minutes...'***

Mr. Boura also pointed to research that shows *that `...the most common cause of death in bushfires is by exposure to radiant heat when people are caught in the open or in vehicles by the fire front.'* In the 1997 Dandenong fires Boura considered that there were three factors contributing to the lack of a significant number of casualties despite a large number of late evacuations. These were:

> ***`...fire intensity was moderate compared, for example with Ash Wednesday and the wildfire fire did not penetrate deeply into the residential area...***
>
> ***...where large evacuations took place the threatened homes were close to the final perimeter of the fire, or beyond it, thus reducing the potential for people to be caught on the road before reaching safe areas...'***
>
> ***`...as most of the fires occurred during business hours many homes were empty thus reducing congestion on the roads'***

Mr. Boura's evidence illustrates that there is still potential for large scale loss of life during any major *`wildfire'* in the combination of circumstances of late evacuation where the fire is more intense, where fire enters deeper into residential areas and it occurs during a weekend or period when people are not usually at work.

The events of 1997 highlight the potential for a larger level of loss of life in the circumstances of late fire warning to the community.

In addition to some concern by residents the United Fire Fighters' Union submitted:

> ***`...The priority should always be to rescue/save life as opposed to extinguishment which is third on the list of priorities as outlined in the CFA's Recruit Firefighter Training documentation.***
>
> ***The Union further submits that the issue of occupants remaining in their household during periods of wildfire/fire in urbanised/semi urbanised areas should be reviewed in the context of maximising the potential for saving lives as opposed to property.***
>
> ***In putting this position forward the relevant authorities should be mindful that firefighting requires extensive training as well as psychological conditioning. Fires are indeed very frightening as well as physically demanding and it is understandable that a person without the relevant training could either become panicked, disoriented or indeed exhausted.***
>
> ***In conclusion we understand that the above fires were indeed significant. However we strongly believe that a reassessment of priorities in relation to evacuation should be given priority...'***

The CFA submission comments that it conducts *`audits'* of its philosophy and the level of community understanding. Apparently some of those *`audits'* were cooperative ventures between Emergency Management Australia and Melbourne University. Also the CFA's approach is *`supported by most emergency services and all fire services.'* However the CFA submission comments that it will:

> ***`...continue to examine the `active defence policy' particularly to ensure that the community understand this and are prepared for bushfires. The CFA's approach...is based on risk management practices and assessments and the CFA has a department dedicated to the ongoing study and implementation of best risk management practices.'***

Any focus on *`risk management'* and the prevention of injury/death should be supported. In this context re-examination of the *`active defence'* and/or *`early evacuation'* policy (and the education/support mechanisms required for the policy) needs constant review. Independent review appears to make sense from the aspect of dealing with large communities in an emergency as each incident presents ability for agencies and the community to learn. But it must be remembered that the comment in the CFA submission that:

> ***`...The diverse range of views and attitudes displayed by residents during the inquest illustrates well the difficulties faced by the CFA in implementing a community education program. Probably the largest single obstacle to an effective community education program is complacency. Regrettably, only a major incident like the fires on 21 January***

1997 will force some people to consider seriously developing a bushfire survival strategy. And often the enthusiasm generated by these kinds of events is relatively short lived. There are others who are fully aware of the dangers but are convinced that they know best to respond and are unwilling to consider the advice agencies like the CFA are prepared to offer.'

However, in view of the level of confusion and apparent lack of understanding of the CFA's approach, as evidenced by some of the witnesses and representatives of combative authorities during the inquest, it may be advisable to have an independent review of the policy direction in the light of an actual event.

Where there are significant risks to life and property, management techniques adopted for the purpose of reducing such risks need to be regularly reviewed to ensure that the stated goals are being met. Although internal audit is one valid way of performing such a review an external process may also assist. Any review would need to be undertaken by an agency with expertise in *`risk management'*.

Recommendation 2

CFA, DNRE, State Emergency Service, Emergency Management Australia and the United Fire Fighters' Union join together and consider conducting an independent and detailed review of the current policy relating to `active defence of homes' and the alternative `early evacuation' in case of `wildfire'.

Any review should be focused on the `risk management' philosophy and address such issues as (but not inclusive of):

- ***the benefits/disadvantages of a `risk management philosophy';***
- ***the benefits/disadvantages of the philosophy of `active defence of homes' or `early evacuation';***
- ***the level of agency/community education necessary to improve the efficiency and effectiveness of a policy focussing on `active defence of homes' and its alternative `early evacuation';***
- ***the level of agency/community infrastructure necessary to improve delivery of the policy `active defence of homes' or `early evacuation';***
- ***concerns expressed by individual members of the community following a major `wildfire' should also be considered in any review;***
- ***previous audits and literature on the policy (ie: CSIRO and internal CFA, DNRE reports, etc; overseas literature should also be considered in this process); etc.***

Any review should be undertaken by a specialist in `risk management'.

Coronial recommendations in the context of *`Recommendation 2'*

There are a number of coronial recommendations that may depend on an affirmative answer to any review of the current direction of CFA/DNRE policy on the management and education of the community in the case of *`wildfire'*. Those recommendations involve such areas as *`individual risk assessments', `community based fire suppression systems',* standards

for residential sprinkler systems, and private fire refuges. That is not to say that any preliminary work on these areas should necessarily cease because of a review.

Areas such as cooperation between agencies/organisations, command and control, communications, standardised equipment, fuel reduction, road access for emergency vehicles, the use of fire fighting aircraft and public fire refuges remain central to the management of any *`wildfire'* disaster and any review ought not to delay improvements on these issues.

A word of caution, work in the area of identifying and rectifying systems problems following a death or fire being investigated by a coroner should, where practicable, be undertaken before the completion of an inquest. It would be unfortunate if identical systems problems in incident management (that may have been preventable by appropriate countermeasures) occur between the commencement of a coronial investigation and before the delivery of a coroner's finding.[21]

The need for individual *`risk assessments'* in areas of high fire risk

Individual home-owners should be encouraged to undertake a detailed professional *`risk assessment'* on their property. As indicated, where lives are at risk in an area of high fire danger (ie: Dandenong Ranges) it would seem that this step should be regarded as the minimum action of the practical and concerned property owner.

The issue of a *`one on one'* education program was raised by Mr. Lindroth. It is noted that the CFA comments that it:

> ***`...does not doubt that a one on one approach to assessment might be effective in getting the message of bushfire safety to residents. However, it is concerned that the suggestion may be impracticable on a number of levels.'***

Those levels include *`the need to regularly review prevention measures and survival strategies in the light of the latest research'* and logistical and training difficulties. In arguing against the *`one on one'* strategy the CFA also points to factors which create some potential difficulties for its current approach:

> ***`...even personnel with the necessary skills can only undertake an assessment of physical and observable characteristics. They are not likely to be able to factor in human behaviour issues. Such as the ability of the householder concerned to withstand the stress associated with a bushfire. This can sometimes be the single most important factor in the successful implementation of a bushfire survival strategy.'***

And:

> ***`...having regard to the many factors that go to make up a successful strategy, there is a real possibility that the advice given in a particular case may turn out to be wrong. The potential liability flowing from this may be serious and the CFA could not countenance***

---

21 See the comments by the State Coroners in the Sims Metal Case (Case No. 863/86) and in the Kew Residential Services Death/Fire Inquests (Case Nos. 1018-1026/96) at pps. 275-76.

taking on an advisory role of the type suggested until it was satisfied that it was adequately indemnified against that liability...'

Clearly, there are currently issues of training, responsibility for general advice and material on fire safety currently given out be the CFA under its existing programs. That does not mean that the direction of the *`risk management'* approach to community fire safety is necessarily wrong. To fully develop a community *`risk management'* approach to fire safety the ability of individuals to consider a *`one on one'* advice procedure is but one essential factor in the whole. A structure that assists this outcome would be desirable.

However, some of the CFA's problems with a one on one program would appear to be resolvable with its comment:

`...It is submitted that this proposal also is one that should be looked at as an enhancement to the existing Community Fireguard program rather than a discrete initiative. This would ensure that residents who may request a one on one assessment are already familiar with the broader thrust of the CFA community education program and understand why there are limits to the advice that the CFA can give. It may not be necessary to restrict those who are offered an assessment to members of a Community Fireguard group. But it should be necessary that those receiving the assessment first attend a limited number of lectures or training sessions so the advice they subsequently get can be put in its proper context. This will both shorten the time needed to make an assessment and help residents to understand that there are elements going to make up every strategy that only they can weigh up; the likely psychological effect on each family member being the most important of these.'

Yet, later in its recommendations the CFA states *`...the one on one house risk assessments not be supported by the coroner'*. However, to the contrary, with the potential for loss of life in areas of high fire risk such as the Dandenong Ranges *`one on one'* assessments by appropriately trained individuals should be regarded (in combination with other programs) as being necessary *`best practice'* for both the prudent and community minded house owner.

The CFA's Community Fireguard Program would need to encourage individual risk assessment (and regular audits) for such an initiative to be of benefit. Because of high risk of death/injury such action (encouragement) by emergency agencies is necessary. A limited and affordable cost structure for the advice may well be considered.

A combination of appropriately trained CFA volunteers to assist in individual risk assessment and/or accredited professionals should be available to be accessed by a community regularly at high fire risk. Guidance should be available as an adjunct to the Community Fireguard Program to assist (and encourage) individuals to undertake this step as a forerunner to making a choice of action in response to *`wildfire'*.

Had such a system been in place (and used) by the Lindroths the outcome may have been different.

Recommendation 3

CFA, DNRE, MFESB, State Emergency Service, the United Fire Fighters Union and Local Government consider the benefits of encouraging residents in areas of high fire risk to undertake individual risk assessments.

That the combative fire agencies consider establishing the appropriate training structure for CFA personnel and professionals to enable `one on one' assessments to occur as part of the existing Community Fireguard Program.

Documentation and advice on `one on one' assessments should also be developed to assist.

Community based (or local) fire suppression systems

The submissions from CFA/DNRE were complementary about the fire preparedness, reduction and fighting methods used by one resident, Mr. Max Cameron. DNRE stated:

> ***`...that where people are properly prepared and suitably equipped they may, in addition to protecting their own assets, be able to offer some assistance to their neighbours. The presence of a firefighting pump (non-electric), sufficient hose and an independent water supply was effective in saving homes on 21 January. A network of similar systems throughout the 'built up' area of the Dandenong Ranges must be of assistance in combating wildfire. We support the concept where people are properly trained, prepared and equipped...'***

And the CFA commented that Mr. Cameron had developed:

> ***`...an impressive fire suppression capability, including 40.000 litres of stored water, an extensive garden sprinkler system, 60 metres of fire hose and underground reticulation from a pump that takes the stored water to each of his boundaries...'***

Mr. Cameron succeeded in preventing serious damage not only to his own home but also the homes of several of his neighbours. If the concept of *`active defence of homes'* is considered appropriate, by way of example, Mr. Cameron's action provides a very useful model that needs careful examination.

Encouragement and assistance by way of advice, assistance with equipment establishment, training (and regular re-training) for groups of residents who a willing to establish systems would be needed if such a concept was to be successful.

Recommendation 4

CFA, DNRE, MFESB, United Firefighters Union, State Emergency Service, Local Government (ie; Shire of Yarra Ranges) consider establishing a pilot program to initially provide a limited number community based fire suppression system in an area of high fire risk such as the Dandenong Ranges.

Ideally any individual community based system should be a discrete cooperative arrangement between a limited number of residents. It should <u>not</u> be considered as being an alternative to agency based fire suppression but aimed at assisting residents to manage their individual risk.

The introduction of such a system would need to be accompanied by a system of audit to ensure that it was effective and met the group of residents' needs.

Communication

Effective communication between combative agencies in any disaster situation is essential for management. Communication also needs to flow to the community[22] in a timely way to assist in the process of early warning and management of risk.

The CFA submission acknowledges some difficulties with communication during the 1997 Dandenong fires. The submission states that most:

> ***`...of the problems encountered by witnesses engaged directly or indirectly in fighting the fires were caused or contributed to by communications difficulties. Most of those communications difficulties were largely beyond the control of the CFA because they were caused by factors such as the changeover to the narrow band radio channels and manufacturing defects in the radio sets. It is reasonable to suppose that in similar circumstances involving, in particular, similar topography and multiple fires moving at high speed, there are likely to be some communications difficulties...'***

Any failure in effective communication between emergency management agencies and the community has potential for disaster. The issue of communication (and the problems) is summarised in by the Arson Squad investigators in the Coroner's brief:

> ***`...A large number of C.F.A members raised concerns over the quality of the communications in the Mt Dandenong Ranges and the different types of equipment which isn't compatible. They also complained about the paging system with VicFire constantly paging them about fires whilst they were actually engaged in fighting a fire. The C.F.A communications throughout the fire has been described as chaotic.***
>
> ***There was a major problem with police communications throughout the Dandenong's with a lack of communication experienced in many areas due to `flat spots'. The police operations during the fires were switched to channel 45 and that caused immediate problems with communications. The lack of communications between the units on the ground and the Command Centre made it almost impossible for accurate flow of information to occur. This left all involved with a lack of information regarding the***

---

22 Ie: via a dedicated Media channel and through those managing the emergency at roadblocks and fire refuges.

actual locations of fires, the extent of those fires and for the command team to allocate resources.'

Problems associated with communication in large fires (or other disasters) are not unusual. For example the 1994 Senate Report commented that during the NSW and WA fires communication was a problem. This was particularly so in Sydney where `*...the convergence of many interstate fire crews, all with differing radio communication'* caused `*organised chaos.'* The problems with different states and agencies using different systems led the Senate to recommend a review of emergency communication throughout Australia:

`...with a view to finding ways of achieving standardisation and compatibility among and between state emergency services.'

The Senate also recommended that the voluntary group *`WICEN'* also be involved in the group formed to look at *`standardisation'*.

The CFA in its detailed submission commented that the move to the *`narrow band'* had been as the result of a long term (five year) planning process. This process was commenced in 1991 by the Commonwealth Department of Transport and Communications, when it opted for new frequencies and to move away from the *`wide'* to a *`narrow band'*. The project:

> ***`...was not only extensive but required users to move from equipment that was well known to them to something totally new and more complex.'***

The CFA submission argued that the criticism by the United Fire Fighters Union *et al* that it:

> ***`...should somehow have avoided introducing a new radio systems during the fire season demonstrates a clear lack of appreciation of the scale of that task...'***

The CFA pointed to some of the difficulties of training a volunteer organisation with over 70,000 members and that it was:

> ***`...difficult to train volunteers effectively until after the cut-over had been completed and, even when comprehensive training is arranged not all volunteers can be expected to attend any given training session.'***

It cannot be denied that in a large organisation there may be difficulties with the *`culture'* and training in the introduction of any new system.

One of the difficulties encountered in the January 1997 fires related to design and training problems with the advent of new radios. The problems and contributory factors are explained in detail in the CFA submission from *7.2.7 to 7.3.15*.[23] The main difficulty associated with the roll out of the new system is that, to introduce it during a potential period of high risk (December, January, February and March) in an historical area of high fire risk (Dandenong Ranges), may be viewed as being fraught with operational danger.

The United Fire Fighters' Union appears to recognise this problem when it states:

> ***`...communications should not have been subject to a staged program of replacement. Evidence before the 1983 inquiry, and indeed this inquiry, clearly illustrates the importance of effective communication systems to the relevant emergency services.'***

Whether the confusion associated with the operation of the new *`narrow band'* radio system exacerbated the fires is not possible to say. Suffice to say that it caused problems in the management of the event. With appropriate planning these problems were avoidable.

The CFA submission also pointed to difficulties with *`inter-agency'* radio communication. The comment was made that, following the fires, significant advances were made:

> ***`...in ensuring the compatibility of CFA and DNRE communications as a result of the FAII Project by, in particular, the adoption of common channel labelling...However,***

---

[23] See Appendix 3.

following the Caledonia River fires in East Gippsland last summer, the Victorian government provided funding to the DNRE to upgrade its communications network. This upgrade has produced some new areas of incompatibility between the communications systems of the two agencies...

...The CFA will need additional funding in the order of $2.5 million to undertake a similar upgrade. It does not presently have the financial capacity to undertake the upgrade...'

As this issue (following the Caledonia River fire) is not a matter that is the subject of these inquests specific coronial recommendations are not appropriate. However, as *`communications'* problems are invariably mentioned in most major incidents, improvements between agencies require support.

Telstra also made significant comments in its detailed submission. The comments, by way of conclusion, are broken into two parts:

`...The first, is for the industry to ensure that all carriers and carriage service providers involved in the supply of DISPLAN services are actively involved in the work of all of the self regulatory bodies which currently operate in Victoria, in particular the centrally important State Emergency Response Communications Sub-Committee, so as to ensure a comprehensive and co-ordinated industry response to disaster planning.'

And the second:

`...is for the industry, through that process of consultation and review, to take responsibility for establishing a self-regulatory code for the activation and provision of emergency telecommunications services in times of community disaster.'

There is no doubt that this direction should be encouraged. It is in the community's interest. There are potential benefits for the community in all agencies (public and private) working together without organisational boundaries placing unnecessary restriction. As emergency communication is no longer solely the boundary of the public sector an increasing level of *real* cooperation is essential between the public and private sector.

One issue that regularly is raised in the context of the management of major disaster is the ability of a private communications organisation to rapidly mobilise to assist professional agencies. That organisation is a group of amateur radio operators, going under the name *`WICEN'*. It should be noted that *WICEN* was referred to as a necessary contributor by the *`1994 Senate Review of Disaster Management'* to the Committee's recommended review of the subject of communications by emergency agencies. The additional assistance that *WICEN* could give to *`wildfire'* emergency management was also the subject of evidence in the 1997 Dandenong fire inquests.

Whether the communications problems are between police, between police and other emergency agencies, internal at individual agency level or between the command agency and the community it is vital that *`the communication system'* works seamlessly and confusion is minimized. In this regard, it is noted that the DNRE submission comments:

`By the start of the 1998/99 season all CFA radios will be compatible with those of NRE and both systems modified to reflect a common system of channel numbering.

In addition, NRE has significantly increased its holdings of communication resources and has strategically located backup equipment that can be rapidly deployed in emergencies to significantly enhance radio communications.

Further, NRE is currently involved in the development of an Incident Channel which will be supported by additional repeater stations at fifty strategically chosen sites across Victoria. This development will enable a more complete conventional coverage of the State and is scheduled to be fully operational by the start of the 1999/2000 fire season. CFA radios will have access to this system.'

This work by both fire agencies should be supported and commended. It is noted that other emergency response agencies do not have compatible systems.

However, it still must be stressed that if the perennial communications problems during major disasters are not identified and rectified lives will continue to be at risk or lost.

Recommendation 5

Where new communications technology or systems are to be introduced in an area of high fire risk the roll out and training (if possible) should not be undertaken at a crucial time for that risk.

Recommendation 6

That the private (and public) telecommunications industry follow the lead of Telstra in its submissions to the Coroner and work actively with the emergency and other relevant agencies to ensure that community has the best possible telecommunications systems to assist the Community in the event of a disastrous fire.

To this end the telecommunications industry should also develop a Code of Practice to govern its response to the reduction of the effect of, and management of any fire related disaster (it should be noted that the coronial recommendations and `Code' could equally apply to any disaster situation).

Recommendation 7

That the potential for communications assistance in a major `wildfire' emergency by WICEN be examined by the CFA, DNRE, State Emergency Service, Emergency Management Australia and the Victoria Police.

Road access to fire – the role of Councils, CFA, DNRE and the Community

The fires in the Dandenong Ranges in 1997 identified serious problems with road access to the fire ground. In some areas the ability of fire appliances to turn on access roads in residential areas was severely compromised. In the case of some private streets fire fighters refused to drive their vehicles for fear of being trapped.

According to the Shire of Yarra Ranges, prior to the January fires, the issue of fire appliance access to private roads had not been raised at the level of the Municipal Fire Prevention Committees. Apparently, in March 1997 a working group was formed to consider the issue and additional signage was recommended in relation to access difficulties. The Shire's submission points to the fact that:

> ***`...Many of the private streets, which might be identified as causing access problems, are on steeply sloping terrain. In many instances widening to include turning bays and passing areas may create engineering problems with resultant concerns about landslip and environmental scarring. This requires a balance of competing interests.'***

The Shire submission points to local brigade knowledge as being *`...the single most important factor in determining whether access is safe...'* And is concerned that *the `...presence of warning signs may lull firefighters into the false belief that those streets without signs are safe to enter.'*

The Shire submission also points to the fact that regardless of:

> ***`...what works are undertaken, the most critical factors determining safety of access are conditions relating to weather, fuel load, direction of fire...'***

In spite of the Shire's cautionary comment, in order to enable the fire fighting agencies to more effectively manage and reduce the potential risk of fire spread throughout a community, road access is vital. Whether that access is via a private or public road network makes little difference to the philosophy of managing the risk.

However, with responsibility for private roads resting on individuals it does, for all practical purposes, mean that in some areas of private roads there will be no fire protection via the emergency services. Without adequate access fire fighters will not enter areas for reasons of their own safety. This is both understandable and reasonable.

For the protection of individual homeowners (and their families), the community and the emergency services adequate road access is one of the first steps in the process. Well-designed road access provides a safer route for evacuation, the ability for emergency vehicles to enter an area for fire fighting purposes and the means of escape where necessary. For an individual private landowner or group of owners sharing access to their homes via a private road the issue of improvements to the road for the purpose of facilitating emergency vehicle access is wider than those individuals. Improved roads may provide the ability for the fire agencies to check the growth of a fire throughout the community or access other areas for the purpose of rescue.

The Shire's comments, about the responsibility resting with the local Municipal Fire Prevention Committee to raise the issue of specific private roads in its area of operation, has some initial attraction on the basis of encouraging a sense of community ownership of the issue. However, this approach avoids agency responsibility to identify the risk and work with the community on the problem.

The CFA does not support the use of a database of potentially hazardous roads. It argues (with the Shire of Yarra Ranges) that there will be variables and it should ultimately be left to the commanders in the field as to whether to enter a particular road. Whilst the ultimate decision will no doubt rest with the commander it is also essential (from and occupational

health and safety perspective) that he/she has the best available assistance and knowledge of risks/risk factors for particular roads. Even allowing for potential variables this could be best undertaken (and logged on a database) prior to the fire. The availability of this tool should be considered as an enhancement to local knowledge.

Recommendation 8

CFA, DNRE, United Fire Fighters Union and State Emergency Service with representatives of Local Government (in the Dandenongs - the Shire of Yarra Ranges) work with all Municipal Fire Prevention Committees to identify the specific private roads (or other roads) which are at risk for entry of emergency vehicles during fires with a view to:

- ***identifying, funding and prioritising road improvements (in particular private roads) in areas of high fire risk;***
- ***identifying and resolving barriers to safety improvements in private roads in areas of high fire risk;***
- ***ensuring that a system of standardised signage is introduced warning emergency vehicles about roads that evidence a risk to entry;***
- ***identifying potential countermeasures (and/or mapping alternative routes of entry for emergency vehicles);***
- ***establishing and maintaining a database of at risk areas; and***
- ***establishing a system of audit to regularly review roads to identify at risk areas and changes that may effect safety.***

It may be considered that the addition of road engineers from VicRoads on any Committee established for this purpose may be of assistance in relation to design and construction problems.

House design – sprinkler systems and/or the use of private refuges – the need for standards

Apparently *`ember attack'* is the most common cause of house loss. The CFA submission points to the fact that an:

> ***`...undefended house will often be well alight before the fire front arrives because of embers blown ahead of the front. In areas like the Dandenongs with its species of stringy-bark trees. Embers can be landing in and around houses for up to 30 minutes before the fire front reaches residential areas. This will often lead to what some residents observed as houses 'exploding' ...there is no evidence to support the notion that houses explode in bushfires because of the build-up of air pressure from heat, especially in Australia where most homes are well ventilated. Almost always, what they are witnessing is a house already well alight succumbing to a `flash over'.'***

Generally, most houses survive the initial fire front and if the *`...fire intensity in the immediate vicinity is reduced by managing the fine fuels...'* However, the submission points out, that many houses *`...that survive the passage of the fire front burn down in the hours afterwards if there is no one present to extinguish fires caused by ember attack.'*

There is an *Australian Standard* for Building in Bushfire Prone Areas *(AS 3959)*. The standard is applied under various building codes adopted throughout Australia. Designating

a *`bushfire prone area'* is the responsibility of local councils. In the case of the Dandenong Ranges the relevant council (the Shire of Yarra Ranges) has designated all of the area *`bush fire prone.'* According to the CFA the CSIRO considers that:

> ***`...if a building is properly designed, constructed and sited and the surroundings suitably landscaped. The building itself is likely too provide shelter from a bushfire for the period of the fire, which in most cases is less than 30 minutes. It is feasible to upgrade a room of the house to provide better protection from heat and smoke than the rest of the building. Children and elderly occupants can shelter there while able-bodied occupants monitor the rest of the interior of the building for ignitions. If the occupants are unable to extinguish a fire inside the building, the upgraded room may provide temporary shelter for the short time it takes for outside conditions to improve...'***

The deaths at 29 Seabreeze Avenue provide a *cautionary* note for this approach. Unless a family is well versed in some of the problems associated with taking of shelter in an enclosed area in the house there is potential for tragedy. The deaths of the Lindroths and Ms. Erin have demonstrated that there is no safe haven in the average home. In any event, many of the homes in the Dandenongs may not comply with the relevant Australian Standard (or the CSIRO suggested landscaping) creating an increased level of risk for the owners.

In certain limited circumstances, a private residential fire refuge may be appropriate. However, there is currently no standard for either when such a refuge may be appropriate, or how it should be designed, sited, equipped and used (also there are no standards for public fire refuges). Certainly, had there been an Australian Standard for private residential fire refuges, the clue may well have been given to the Lindroths that their garage was inadequate.

There is no standard for sprinkler systems. The CFA submission comments:

> ***`...Although external sprinklers are not likely to be effective alone, they may be an effective component in a bushfire protection strategy – particularly if they are combined with careful management of the surrounding area and their own water supply and petrol driven pump. However, some sprinklers are more effective than others...The effectiveness of the system will also be dependent on the arrangements made for turning them on if there is no- one home when the house is threatened by fire...'***

Evidently there is scarce information about well-designed sprinkler systems. The CFA (and Shire of Yarra Ranges):

> ***`...supports the introduction of a standard for external sprinklers which recognises their role as one part of a bushfire protection strategy'.***

However, the CFA indicates that any question of making installation of such systems compulsory is more problematic (on a cost basis) and that:

> ***`...Unless a suitable system can be developed at a reasonable price. It may be more realistic to opt for incentives for the installation of sprinkler systems, rather than compulsion. For example, a tax exemption or insurance discount.'***

Recommendation 9

CFA, DNRE, State Emergency Service and Emergency Management Australia and other relevant agencies (ie: Standards Australia) consider the development of appropriate standards for the use, design and construction, siting and equipping of private fire shelters in bush fire prone areas.

Recommendation 10

CFA, DNRE, State Emergency Service and Emergency Management Australia and other relevant agencies (ie: Standards Australia) consider developing design and construction standards for external sprinkler systems for use in bush fire prone areas.

Any system would need to be as economical as practicable to encourage maximum use by all householders within a bush fire prone area.

The need for a safety standard for public refuges/emergency shelters

One of the most important issues for the effective management of large numbers of people during a major *`wildfire'* emergency is the provision of safe community fire refuges and emergency shelters. Currently there is a multi-agency committee reviewing the provision of refuges for the community during a fire or major emergency. It has already been noted that the Arson Squad commented as part of its preparation of the brief for the Coroner:

> Fire Refuges and Emergency Shelters
>
> ***`...Many residents were unsure of the location of the emergency shelters and relief centres. There is a lot of confusion in relation to what a fire refuge is and what an emergency shelter is. Many residents self evacuated to locations that were not designated evacuation centres which placed them at risk as no police or other support agencies knew that they were there and therefore could not assist or register same.'***

In addition, it is important to ensure that any designated *`fire refuge'* or *`emergency shelter'* is in fact *safe* for the community in the event of *`wildfire'*.

It may be appropriate to consider the issues of application of relevant building fire safety standards and the provision of equipment to assist in withstanding and managing a *`wildfire'*. Issues that may need to be considered relate to communications, adequate water supply, alternative power supply, pumps and firefighting equipment, fuel reduction in the immediate vicinity of the refuge, safe road access routes and adequate parking for the community, etc.

Recommendation 11

CFA, DNRE, State Emergency Service and Local Government consider developing safety standards for community fire refuges and emergency shelters.

Those standards should address the issue of the areas (or buildings) ability to protect large numbers of the community in the event of a `wildfire' in the immediate vicinity.

Fire agency response times and standards of fire cover in the urban/rural environment

The issue of fire response times and standards was briefly raised by the United Fire Fighters Union during the inquests. Detailed evidence on response times during the Dandenong Ranges fires was not introduced, either in the initial investigation or in the hearing of the inquest.

Apparently, response times for the CFA were first canvassed during the 1993 Victorian Parliament Public Bodies Review Committee into the MFB (as it was then known). In its submission to the Committee the CFA commented on its Standards for Fire Cover (quoted in the Union's submission to these inquests):

> ***`...CFA uses classifications for the purposes of SOFC that reflect models used widely throughout the world deriving, principally from the UK Home Office model with appropriate modifications to reflect different demographics.***
>
> ***The CFA has Standards of Fire Cover which acknowledge the uneven fire risk in the communities it services.***
>
> ***The provision of fire cover is uneven because fire hazards may be clustered into groups (industrial estates for example), whilst in rural areas may be significantly low. To prevent fire spreading, the CFA model specifies minimum number of appliances to attend, together with the maximum time limits for their attendance, at fires in localities of each category.'***

In its written submission the Union put forward a summary of its view of the CFA's position for some of the relevant areas in the 1997 fires:

> ***`... the CFA has conducted hazard assessment of various areas and applied the Standards of Fire Cover equivalent to the risk involved. It appears from CFA records that the Seabreeze Ave fire falls within the Class 2-3 response as defined in the CFA's Standard of Fire Cover measurement. A class 2 requires an 8 minute response for a first appliance and an additional appliance within 20 minutes. The 8-10 minute time frame, depending appropriate class, is regarded as the essential time frame to attend a fire from the time of call to the time scene so as to provide effective suppression. The response time also minimises the risk to human life and properly.'***

The Union further comments to the effect that material on times was not made available to assist in the assessment of the CFA's response in the 1997 Dandenong fires. The Union also submitted:

> ***`...Mr. Kirkham QC, counsel for the CFA submitted some 260 units were dispatched in response to the fires and that a number of these were diverted. He submitted that due to the diversions and the problems encountered with communications the response times would be meaningless. He also indicated that it would cost the Authority between $8,000 and $10,000 dollars to generate a computer program to provide this information in respect of response times. He also indicated that following an Freedom of Information application made by the Union the CFA had provided data to the Union concerning response times and that it was incumbent upon the Union to make further submissions in***

relation to the response times. He also indicated that it was not clear to the CFA that the Standards of Fire Cover applied to bushfires.'

There was no detailed work provided to the Coroner on this issue. The Union explained that this was because information provided was *`incomplete and is not sufficient to provide the type and quality of analysis which would be of use to the Court.'* The Union also submitted:

> ***`...The Union notes that while Mr. Kirkham QC stated that a number of the 260 units deployed were diverted, no information has been provided as to their number. This information is available to the CFA from the records kept in relation to fire attendances, which provide an ability to log the diversion of a particular unit. Whilst the Union acknowledges such diversion may effect the relevance of response times for some or all of the diverted units, response times for those units not diverted remain highly relevant.***
>
> ***Specifically, it is the initial response times of the units first deployed which are the most important and the Standards of Fire Cover must at the very least apply to them. In addition to this the diversion of additional units would not have occurred until CFA Command had assessed the overall situation. If there is more than one call for different fires, the station nearest to the fire will generally be called to attend that fire and will not be diverted. This clearly ensures that the Standards of Fire Cover is applicable to that station.***
>
> ***It is therefore the Union's contention that the CFA is not correct in arguing that the presence of diverted units renders worthless the data concerning response times and their applicability to the Authority's Standards of Fire Cover.***
>
> ***The Union also opposes the notion that difficulties encountered with communications render response times irrelevant. Poor communications may contribute to response times that fail to meet the relevant Standard of Fire Cover. However, this may only be one factor resulting in communications masking other problems that need to be thoroughly investigated and addressed.'***

These issues are far too important for the overall safety of the community during developing *`wildfire'* to be considered during these fire inquests without adequate evidence, examination and comment from all parties. It must be acknowledged that there are different issues and difficulties to be considered in relation to response times and fire cover to those facing an urban area. However, at first glance it would appear that the close examination of the issues by all concerned may well lead to the development of appropriate and effective standards.

For all of the issues to be worked through and effective standards be developed it is important that all the agencies and organisations work together in that spirit of co-operation that is evidenced as between fire response agencies such as DNRE and the CFA.

From a Coroner's perspective, a philosophy of *`managing and reducing the risk'* to the community during *`wildfire'* would necessitate the development of standards for response times and fire cover in areas of urban/rural interface. With the significant risk to life associated with rapidly developing *`wildfire'* trespassing into urban/rural areas issues of timeliness (and cover) of response by fire fighting units would appear to be unavoidable.

Once standards are developed for fire response and cover it would also be important that a system of audit be developed to identify areas where the standard is not met and improvements in systems (ie: training, equipment, etc) may be necessary. Appropriate systems for the recording of information on response times would also be important for monitoring.

Recommendation 12

That consideration be given to establishing a review committee, auspiced by the Department of Justice, to examine the issue of standards for response times and fire cover to `wildfire' for CFA (and DNRE) in the urban/rural interface (also in rural areas).

Membership of the Committee should include representatives of CFA/DNRE, MFESB, State Emergency Service and the United Fire Fighters Union. Additional independent experts may be necessary.

As part of any review consideration should be given to the establishment of adequate reporting, data collection and audit systems.

Recommendation 13

In the event that Standards and information collection systems are developed for Fire Response and Cover, in any `wildfire' investigation for coronial purposes, an appropriate expert analysis of the information would be required. That analysis would no doubt include such issues as assessment of performance and potential areas of improvement.

The issue of timeliness, use and cover of air fire-fighting units may also need consideration as a discrete issue under the heading *`Response Times and Standards of Fire Cover'*.

The air fire fighting capacity

One issue that was raised during the inquests involved the provision of the larger variety of fire fighting aircraft to assist the combative agencies in reducing the spread of *`wildfire'*. Discussion and evidence included comment on issues such as availability of a fleet of smaller dedicated craft for fire suppression and spotting activities. The larger range of fixed wing amphibian aircraft and helicopters dedicated to depositing large amounts of retardant and/or water on a *`wildfire'* remained the focus of some of the evidence.

It is noted that an evaluation was undertaken of the large Canada Air CL-415 by the Australian Fire Authorities Council. The Evaluation Report, completed in March 1996, comments:

> ***`The use of aircraft for bush fire fighting in Australia has evolved over the past three decades. It is now a normal practice for most fire agencies to use both fixed wing and rotary wing aircraft to deliver initial attack and to support traditional ground suppression resources. To this point most of the aircraft used are agricultural type aircraft and helicopters equipped with buckets or tanks The use of large air tankers has not been common, and scooping aircraft, in particular, are not yet used in Australia.***

Canadair has a long history in worldwide fire fighting operations and aerial technology. The first aircraft speci5cally designed and built for aerial fire fighting – the CL-215 – was placed in service in I969. Since then, over 100 of these aircraft have been introduced into active bush fire fighting service in nine countries including six Mediterranean countries.

The CL-415 aircraft is the latest version of this amphibian fire bomber. It has been enhanced with larger tankage (6100L) four door compartment drop system and powered by two Pratt and Whitney PW 123AF turbo prop engines. Twenty-four of these advanced fire fighting aircraft are now in service in France, Quebec and Italy.'

The Evaluation Report on the later version of the CL-215 (CL-415) by the Council comments that observation and analysis of the results has proven that the CL-415 can:

- ***operate in Australian weather, fuel, scooping and organizational conditions.***
- ***deliver large volumes of suppressant accurately to incident sites with penetration and footprints that are effective.***
- ***respond quickly and aggressively to new incidents and be integrated within existing command structures.***
- ***use the designated water scooping sites, including the ocean.***

A submission was received from Mr. Paul Phelan (Executive Editor of Flying Australia) in October 1998 critically commenting on the failure to use and deploy the CL-215. He wrote that it was his understanding:

> ***`...that the two aircraft, when they were called in to participate in the fire control operation, demonstrated beyond any doubt the effectiveness of the firefighting system, quickly bring the fire under control in the area where they were used, and preventing a situation developing which had the potential to cause considerable further damage and loss of life.'***

The CFA responded to Mr. Phelan's submission so far as larger capacity fire fighting aircraft are concerned:

> ***`...the Erikson S64 Air Crane helicopter provides an extremely effective firefighting resource that is more flexible than the large capacity fixed wing water air bombers, such as the Canadair CL-215 and CL-415.'***

And that the *`...flexibility of the Air Crane was demonstrated to great effect during the fires in the Dandenongs earlier this year.'* The CFA argued that the advantages of the Air Crane (over Canadair fixed wing bombers) are:

> ***`...greater capacity (9000 litres compared with up to 6000 litres, depending on how effective the scoop is);***
> ***it can fill from a water source as small as 2 metres across and 60 cm deep (including a storage unit containing fire retardant), unlike the Canadairs which require a substantial lake or reserviour;***
> ***it has a more sophisticated mechanism fur releasing water or retardant that allows it to do discrete and precisely targeted drops of part of its load in several different locations; and***
> ***being a helicopter, it is highly manoeuvrable, which can be important for both safety and effectiveness, particularly in mountainous areas...'***

That the submission from Mr. Phelan:

> ***`...overlooks the fact that the CFA and DNRE have clearly demonstrated their willingness to commit substantial financial resources on suitable fire fighting aircraft. The CFA accepts that the Canadair aircraft can be a very effective fire suppression tool under certain conditions. However, to date the Sky Crane has proved to be more effective over a much wider range of conditions. Thus, for the time being the Sky Crane is a better investment of the admittedly limited resources available to the CFA and DNRE to spend in insuring that each bushfire season the State can call on the most effective and flexible fleet of aircraft that can reasonably be assembled...'***

Finally, that CFA urges the Coroner to support the use by the CFA and DNRE of a *`flexible fleet of dedicated fire fighting aircraft'* and that *`availability of aircraft be commensurate with the risk of the fire season.'* There is little doubt that any fire fighting agency (or group of agencies) should have available, at the commencement of any appropriate fire risk season, a broad and flexible fleet of dedicated firefighting aircraft.

The submission for DNRE points to the fact that contract arrangements for firefighting aircraft have been managed by its Department from 1989 on behalf of both DNRE/CFA. The stated aim of the agreement is to:

> ***`...ensure optimum efficiency, safety and effectiveness of aerial firefighting operations for the State of Victoria...'***

The arrangement provides for an ability to quickly add additional aircraft to a core fleet should a bad season be predicted as was for *`...the 1997/98 fire season...'* The *`number and configuration of the core fleet is reviewed annually pre season and the performance of aircraft is evaluated at the end of each season.'* The DNRE submission comments that both aircraft (CL215 and Erickson):

> ***`...can play an important role in fire suppression but the Erickson has attributes which are more suited to Victoria's needs. It should he stressed however that the Erickson machine is only one of several larger aircraft of similar high volume capabilities available for firefighting. Further it may be that the predicted severity of the season does not warrant the use of such an aircraft and that funds could be more fruitfully spent on fire prevention activities.'***

The CFA also made comment that *`...no recommendation is made in relation to the type of aircraft used but that it be recognised that the Erikson Air Crane may be more suitable for Australian conditions than the Canadair 415.'*

There is insufficient material on which to draw any reliable conclusions on comparative use of the Erikson Air Crane and the Canadair CL-415 for all potential circumstances and Australian conditions. In addition, the conclusion sought would be well beyond the scope of these inquests.

Recommendation 14

That DNRE/CFA be fully supported in their requirements to have available for deployment, at the commencement of any appropriate fire risk season, a broad and flexible fleet of dedicated fire fighting aircraft. Such aircraft should also include deployment of sufficient numbers of the larger range of fire fighting aircraft to assist in managing and reducing the spread of `wildfire' so as to maximise the potential to reduce loss of life, injury and property damage.

As far as practicable the larger aircraft should be available for rapid deployment in areas (and days) of high fire risk. The aircraft should be rapidly used to reduce the spread of `wildfire' into urban and rural residential areas.

Response times for fire fighting aircraft (within the context of overall management of a wildfire) should also be considered.

Fire investigation and community safety – joint reports

There has been in existence for a number of years, a *`Victorian Fire Investigation Policy & Procedures'* memorandum of understanding. This MRU was agreed between a number of agencies with the responsibility for fire investigation. The MRU developed a protocol for joint investigation and information sharing by and between fire investigation agencies that has been an important step in the total cooperative process following fire. The MRU helps to maximise multi-agency knowledge and resources leading towards improvements in investigation procedures and eventually resulting in greater community safety.

Where there are joint fire investigations into major *`wildfire'* disasters effecting the safety of the community, rather than each agency presenting its own individual report/review, a *joint* reporting process may well assist in efficiently communicating and developing all of the public safety/systems improvements. The *`FAII'* Report by the CFA/DNRE is a useful guide in this regard – it draws together many of the issues and systems improvements across the <u>two</u> organisations.

However, following the inquests, there still remains a multiplicity of major submissions/reports covering a variety of issues involving fire safety and important community issues following the disaster. To help identify the issues and provide comparisons it might be useful if all of these reports/submissions were to be drawn together in future investigations.

A large number of individuals, some of whom were witnesses to the fires, made significant suggestions for improvements. The suggestions were made during the hearing and, in some cases, in writing after the close of evidence. All of the suggestions need to be drawn together for the purpose of review.

Recommendation 15

The various agencies involved in investigating and/or managing a major `wildfire' in future consider providing a joint report to assist in maximising the benefits of a wider approach to community safety and utilising all of the expertise of the respective organisations.

Agencies would include DNRE, Fire brigades, State Emergency Service, Ambulance, Police, Workcover, Telstra, Local Government, United Fire fighters Union, etc.

The fire investigation teams and the Dandenong fires

There were a number of individuals and agencies that contributed a considerable amount of investigatory work following the fires. The teams involved range from Victoria Police Arson Squad *`Operation Hudson'* to investigation teams from the CFA and DNRE. All are to be commended for the thorough and comprehensive nature of the work.

If all that has been detailed in the investigators' reports (and subsequent reviews) is used to full effect lessons will have been learnt by both the individual agencies and the wider community.

The commitment of volunteers, professional emergency service workers and individuals in the community

During all of the fires in Victoria in 1997 a large number of individuals, both volunteers and professionals, committed their time and in some cases probably risked their lives to protect the wider community. They must be commended for their work.

Individual members of the community, such as Mr Max Cameron who protected both his own and neighbours' properties, are also deserving of commendation.

Graeme Johnstone
State Coroner
25th June 1999

Messrs. Andrew Kirkham QC and Ted Woodward for the CFA,
Mr. Peter Holding for the United Firefighters Union (Victorian Branch) on 8th and 9th of September,
Mr. John Simpson for Telstra Corporation Limited (from 9th September),
Mr. Paul Darcy for the Department of Natural Resources and Environment,
Mr. Klaus Muller for the Shire of Yarra Ranges,
Ms. Susan Phillips for Yarra Valley Water (on 7th September), and
Sergeant David Dimsey, Assisting the Coroner.