

SHERIFFDOM OF GRAMPIAN, HIGHLAND and ISLANDS at INVERNESS

Fatal Accident Inquiry

Under the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act, 1976

2014 FAI 1

Case No. B207/13

DETERMINATION

by

SHERIFF MARGARET M. NEILSON

**following an Inquiry at
Inverness Sheriff Court
into the circumstances of the death of
JOHN CAMPBELL MACKINNON**

INVERNESS, December 2013

The Sheriff, having resumed consideration of the Fatal Accident Inquiry into the death of John Campbell MacKinnon, Determines in terms of Section 6 of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act, 1976 as follows:

In terms of Section 6(1)(a)

The late John Campbell MacKinnon (date of birth 28 September 1946) of Cuillin View, Crossal, Isle of Skye, died at Kyle Farm, Skye on 22 December 2011 at around 12.29.

In terms of Section 6(1)(b)

The cause of Mr MacKinnon's death was (a) electrocution by a high voltage transmission line and (b) a forestry plantation incident.

In terms of Section 6(1)(c)

Reasonable precautions which might have prevented Mr MacKinnon's death include (a) the deceased not driving the crane with the jib extended in close proximity to the overhead high voltage power line which crossed the forest track, (b) the existence of suitable "goalposts" with rigid crossbars and distinctive markings at appropriate places on the said forestry track and (c) Skye Transport being provided with information regarding the work site at Kyle farm, in particular a map showing locations of overhead power lines prior to the commencement of work at the site.

In terms of Section 6(1)(d)

The system in place for confirming who had responsibility for the erection and maintenance of "goalposts" at the locus was inadequate and resulted in confusion and lack of clarity between the Forestry Commission (the landowner) and the Forest Works Manager (Mr Michael Thomson of Munro Harvesting) as to who had responsibility for this task. The pre commencement meeting did not involve the haulage company and was not sufficiently robust in terms of clarifying the said responsibilities.

In terms of Section 6(1)(e)

In the circumstances where a vehicle strikes an overhead power line, the safest course of action for a driver or other occupant is to remain within the vehicle unless it ignites in which case he should jump out of it without touching the exterior of the vehicle and "bunny-hop" away from it keeping both feet as close together as possible to minimise risk of electrocution. In addition, in these circumstances, no- one should ever return to the vehicle.

In terms of British and European standard BEN12999:2002, a warning light should be fitted in the cab of the type of crane which was driven by Mr MacKinnon at the time of the accident, to provide the driver with a warning if the crane was not in the correct stowed position prior to it being moved.

Findings in fact

(1) John Campbell MacKinnon was born on 28 September 1946. At the time of his death he resided at Cuillin View, Crossal, Isle of Skye. He was a director of the transport company, Skye Transport Crossal Limited, Crossal, Isle of Skye.

(2) Mr MacKinnon was an experienced haulier and was highly regarded by those who worked with him. He had worked in the haulage business for a lifetime and with Skye Transport in excess of 25 years.

(3) Skye Transport had purchased the independent loader 1 to 2 months before the accident. Mr MacKinnon had attended a training course on 28 November 2011 in relation to operating a lorry mounted crane.

(4) Kyle Farm is owned by the Forestry Commission (the landowner). Munro Harvesting had purchased the sale of timber from the commission and were in the process of harvesting the timber in December 2011.

(5) Mr Michael Thompson (a director of Munro Harvesting) was the Forest Works Manager for this project. He had arranged for Skye Transport to remove the timber. He had dealt with Mr MacKinnon in relation to this work. There was no written contract and arrangements were made either in person or on the telephone.

(6) Prior to the start of harvesting there was a pre commencement meeting. Mr Thompson attended in his capacity as Forest Works Manager. Part of the purpose of the meeting was to discuss health and safety issues. Various parties were represented and a form was completed by Mr Thompson. No-one from Skye Transport or any other haulage firm was invited to attend. Chris Nixon attended for the Forestry

Commission. No discussion of any substance took place in relation to erecting goalposts or warning signage. Mr Nixon was unaware that an independent loader was going to be used, as was everyone else at the meeting. Had Mr Nixon known this he would have raised the issue with Mr Thompson as he did not consider that the access track would have been wide enough for such a vehicle.

(7) At Kyle Farm there were wooden posts with warning signs attached at various points on the access track. These were “legacy” posts which had been erected sometime in the past. They were not up to current HSE standards. For example they were not painted in red and white or other bright colours. They did not have a rigid crossbar. Some had a rope strung between them but others did not. It is unclear when they were erected and by whom but it was likely to have been by a power company a number of years earlier.

(8) The purpose of goalposts is to establish a height barrier. Rope and bunting were commonly used in the past. Guidelines now suggest the use of rigid crossbars where possible. These are more visible and need less maintenance than ropes which can sag and deteriorate. The main purpose is to act as a visible warning. They do not prevent physical contact.

(9) An outline risk assessment was carried out by the Forest Works Manager (CP8) and a copy was given to a representative of the Forestry Commission. No copy was provided to Skye Transport. No maps were provided to Skye Transport but were provided to other contractors. Since the accident Mr Thompson has changed his practice and now provides maps and details of risks and hazards to haulage contractors. He also now discusses goalposts and signage at the pre commencement meeting.

(10) As a condition of the site specific conditions (CP6) the Forest Works Manager required to give notification of the proposed works in writing to the power line owner (SSE) 2 months prior to the works commencing. This was not done.

(11) In early December 2011 the landowner (Forestry Commission) carried out work on the access track at Kyle Farm to increase the size of the turning circle for haulage lorries which would be used to remove the harvested timber. This was at the request

of Mr MacKinnon who had advised that the turning circle was too tight for his vehicles. Liam Matheson was the civil engineer in charge of that work. Previous work had been carried out on the track in around 2008 – 2009. At that time some of the legacy utility posts were rehabilitated by adding bunting.

(12) On 22 December 2011 lorries operated by Skye Transport were being loaded with cut timber at Kyle Farm. Mr MacKinnon was on site operating the timber crane. When drivers appeared he would load the timber onto their lorries. The drivers would then drive away.

(13) Ross Cumming drove his lorry on site that morning. It was loaded by Mr MacKinnon who used the crane in a stationary position. Mr Cumming had never seen Mr MacKinnon moving the crane with its jib extended. He was familiar with the Kyle Farm site having worked there before.

(14) Donald MacFarlane attended with his lorry later that morning. Again it was successfully loaded by Mr MacKinnon. As Mr MacFarlane drove off, at around 12.17, the jib was in the extended position and Mr MacKinnon had just gone back into the cab. Another driver, George Campbell, was due to be next on site. Mr MacFarlane had previously seen Mr MacKinnon move the crane with the jib extended but only over short distances and not as a rule.

(15) In the area of Kyle Farm there was poor mobile phone cover. Mr MacKinnon had, around the time of the accident, been trying to contact the final driver, Mr Campbell, by telephone. He had contacted his co-director Grant Baxter by telephone to ask if he knew where he was at 12.25.

(16) Shortly after making that call Mr MacKinnon drove his vehicle a short distance along the forest road with its jib or boom in a relatively upright position. The jib made contact with overhead power lines over the forest track at 12.29.23.

(17) Sam Catchpole, forest work supervisor with Forest Enterprise Scotland, was visiting the work site on 22 December 2011. His role was to ensure that the site was run in accordance with the contract. He had a back up role in relation to health and safety, pollution and wildlife concerns. He arrived on the site around 13.00 and saw

thick smoke. He walked towards the vehicle which was on fire then heard an explosion. He retreated and called the emergency services, then drove to the end of the road to meet them. On their arrival he escorted them to the scene. He had visited the site around 2 weeks earlier but the independent loader had not been present at the time. Had he been aware such a loader was being used he would have alerted Mr Nixon or Mr Thompson as he knew it would be a far greater risk to the overhead lines than a normal loader.

(18) At around 13.19 on Thursday 22 December 2011 Highland and Islands Fire Rescue Service was informed of a works harvester on fire in forestry between Kyleakin and Broadford. A fire crew was despatched to the incident immediately.

(19) The locus of the incident was approximately 3.5 miles South of Broadford, accessed from the main road by turning right onto a forest track. The fire, police and ambulance vehicles were accompanied to the locus by a forestry vehicle. The police and forestry vehicles stopped in a lay-by while the ambulance and fire appliances continued towards the burning lorry. Fire personnel could see flames reaching heights of about 6 feet above the vehicle and there was thick black smoke coming from the lorry.

(20) At 14.15 the fire appliance stopped around 120 metres from the burning vehicle. The incident commander and a crew manager approached to within 50 metres of the burning lorry on foot. They deemed it to be too dangerous to advance further.

(21) They noted a power cable lying on the ground close to water and oil run-off from the vehicle. They were concerned that the water may be electrified. They went back downhill and checked the verge on their way for potential casualties but found no-one. They were unable to check further uphill because of the presence of the power cable.

(22) A specialist team from Scottish Hydro was called. The station manager at Portree Fire Station (Mr Paul Edwards) attended and took over control of the incident. On arrival he saw the burning lorry approximately 200 metres away from him in the vicinity of overhead cabling. He arranged for a 200 metre cordon to be set up around

the vehicle and instructed that no-one should enter the area until it had been made safe.

(23) A Scottish Hydro specialist team subsequently attended and earthed both adjoining pylons. The area was then declared safe at around 17.55. Police officers and Mr Edwards then approached the vehicle. By this stage it was burnt out with only a few “spot fires” to the sides of the vehicle which required no intervention by the fire service. At this point Mr Edwards and Police Sergeant Niall MacLean noticed the body of the deceased lying on the ground to the right of the vehicle.

(24) Ambulance personnel Dolina MacKinnon and Kyle Alexander were asked to attend. They had arrived at the scene much earlier having received a call at around 13.11 reporting a harvester on fire with a person possibly trapped within but had been turned back by the Fire Service because of the danger. They examined the man who was lying on his back and looked uninjured. They noted that there was no pulse and that he was clearly deceased. They confirmed recognition of life extinct at 17.57.

(25) Acting Detective Constable Scott Templeman attended at the locus at around 18.15. He noted the remains of a badly burnt Scania lorry which had a timber crane attached to the rear. The hydraulic arm was in the extended position. He observed a number of power cables passing overhead in the area and a snapped power cable to the area of the front right of the vehicle. He noted the position of the deceased’s body and took photographs of the locus (CP1).

(26) Dr William Neill attended the locus and pronounced life extinct at 19.30.

(27) At around 20.15 two police officers, including a collision investigator, attended the locus and noted the burnt out remains of an 8 wheeled mobile forestry crane facing uphill on a narrow forest track. The jib of the crane was mounted at the rear of the vehicle chassis and was a two section jib with a timber grab at the end. The grab was resting on the front section of the chassis behind the cab and the jib sections were in a near vertical position. The jib of the crane was found to extend up to about 9.7 metres from the ground. The pylons at the locus had one earth wire at the top and three live wires stacked on one side. The lowest of these wires was broken. The height of the earth wire was about 17.3 metres above the road where the crane was

stopped. The height of the top and middle live wires was about 14.7 and 11.4 metres respectively. The broken wire was thought to have been at a height of 8.4 metres. There would therefore have been an overlap of at least 1.3 metres between the lowest live wire and the crane jib. They concluded that the crane appeared not to have entered the wood with the jib in this position as at least 3 restriction poles positioned between the wood entrance and the resultant position of the crane had ropes in place at a height of 4.8 metres.

(28) On 23 December 2011 the vehicle was examined *in situ* by Mr John Madden, retired principal specialist inspector (electrical engineering) with HSE. He found the jib of the crane to have hit the lower conductor of the connecting power line.

(29) On 23 December 2011 at Raigmore Hospital Doctors Rosslyn Rankin and Grant Stenhouse, both consultant pathologists, carried out a post mortem examination on the deceased's body. They concluded that he died from electrocution by a high voltage transmission line as a consequence of a forestry planation incident. They prepared a report (CP22).

(30) The results of the post mortem examination were given to Mr Madden who concluded from them that Mr MacKinnon had more than likely jumped away from the vehicle without touching it on the outside (the lack of burns on his hands suggested this), however the ground would have been energised by then and the electricity current would have arced from one foot to the other probably causing Mr MacKinnon to fall over although it was also possible he had fallen because of the uneven ground). Burn marks to his back confirmed that a current had passed through his heart which then caused electrocution and subsequent death.

(31) The voltage of 132,000 Volts was such that the accident would not have been survivable. The records from the power company suggested that the current flowed through the vehicle for around 162 seconds. It is likely that the current initially flowed through the vehicle but did not "trip" the circuit. It is likely to have heated the tyres which may have ignited or exploded. In these circumstances the vehicle's metal wheels would touch the ground and the current flowing through it would have increased dramatically. Mr MacKinnon died at approximately 12.29 or during the

subsequent 162 seconds when the ground surrounding the vehicle would have been live.

(32) Any delay in the emergency services or others arriving at the scene or tending to Mr MacKinnon would have had no effect on the outcome.

(33) On 17 January 2012 the site and vehicle (by now removed to a different site) were examined by Mr Ian Simpson, Principal Specialist Inspector (Mechanical Engineering) with HSE. He described the vehicle as a Scania 124 lorry with a tipper chassis which had been strengthened by additional steelwork. It had a high lifting capacity crane attached and had a high capacity hydraulic power pack allowing it to be used for an extended period of time. It had a much higher capacity and higher reach than the vast majority of cranes used for forestry in the Highlands. It was a suitable crane provided there was a safe system in place.

(34) All responsibilities upon SSE/Scottish Hydro Electric Transmission PLC (set out in CP 14 “wayleave agreement”) were appropriately fulfilled.

(35) Subsequently an investigation was carried out by Mr Julian Fryer, area operations manager for the Forestry Commission and an accident investigation report was issued (CP 13).

NOTE

Introduction

[1] This Inquiry was held in terms of Section 1 of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976 (“the Act”) in respect that the deceased, Mr John Campbell MacKinnon, was a person who died while he was in the course of his employment or being an employer or a self-employed person, was engaged in his employment. This is therefore a mandatory Inquiry in terms of Section 1(1)(a)(i) of the said Act.

[2] Section 6(1) of the Act requires the Sheriff to make a Determination setting out the following circumstances of the death so far as they have been established to his or her satisfaction:

- (a) where and when the death and any accident causing the death took place;
- (b) the cause or causes of death and any accident resulting in the death;
- (c) the reasonable precautions, if any, whereby the death and any accident resulting in the death might have been avoided;
- (d) the defect, if any, in any system of working which contributed to the death or any accident resulting in the death; and
- (e) any other facts which are relevant to the circumstances of the death.

[3] The only method of establishing those circumstances is by the assessment of the evidence led by the procurator fiscal and any other interested party represented at and participating in the Inquiry. It has often been said that a Fatal Accident Inquiry is concerned with fact finding and not fault finding. The purpose of the Inquiry is not to attach fault to any person but to inquire into all the circumstances of the accident and the death in order to discover the truth, identify any reasonable precautions which might have been taken and ascertain if any lessons can be learnt which might serve to prevent the reoccurrence of any similar accident.

[4] At this Inquiry, parties were ably represented as follows; for The Crown, Mr Geoff Main, Procurator Fiscal Depute and for the Forestry Commission, Ms Stephanie Higgins, Solicitor. I am grateful to both of them for their conduct of the Inquiry and their careful submissions.

[5] Ms Hay, solicitor, appeared for Scottish Hydro Electric Transmission PLC but took no active part in that she did not examine any witnesses or make any submissions, essentially carrying out a watching brief only. Members of the deceased's family were not formally represented but sat in court throughout the evidence.

[6] The Crown lodged a comprehensive inventory of productions as follows:-

1. Photographic album,
2. Photographic album

3. Photographic album
4. Report by John Madden
5. Report by Ian Simpson
6. Contract of sale including maps
7. Pre commencement meeting record
8. Risk assessment
9. Kyle Farm Combo system of work map
10. Map of accident positions
11. Forestry Commission “Electricity: Goalposts”
12. Forestry Commission “Goalposts Review”
13. Accident Investigation Report
14. Wayleave agreement
15. Vodaphone report
16. HSE Guidance: “Avoidance of danger from overhead electric power lines”
17. HSE Guidance: “Electricity at work: Forestry and arboriculture”
18. HSE Guidance: “Memorandum of guidance on the Electricity at Work Regulations 1989”
19. “Management of Electricity at work – Forestry and arboriculture”
20. HSE Guidance: “Managing Health and Safety in Forestry”
21. Training certificate of deceased
22. Post Mortem Report

[7] The following witnesses gave oral evidence to the Inquiry.

1. Mr Ross Cumming (Skye Transport)
2. Mr Donald MacFarlane (Skye Transport)
3. Mr Michael James Thompson (Munro Harvesting)
4. Mr Liam Matheson (Forestry Commission)
5. Mr Chris Nixon (Forestry Commission)
6. Mr Sam Catchpole (Forestry Enterprise Scotland)
7. Mr Julian Fryer (Forestry Commission)

8. Ms Emily Ramsay (Forestry Commission)
9. Mr Grant Baxter (Skye Transport)
10. Mr Niall Miller (HSE)
11. Mr Ian Simpson (HSE)
12. Mr John Madden (formerly HSE)

[6] In addition a joint minute was entered into and read into the record which included the evidence of other witnesses which had been agreed.

Witnesses

[7] I found the majority of the witnesses who gave oral evidence to be credible and generally reliable. They were clearly trying to assist the court as best they could. A number of them gave the impression of still being shocked and upset by the events of the day in question.

[8] Some minor discrepancies arose in the evidence of the different witnesses when describing the events and some witnesses were unsure of exact dates, times or places, but this was normal given the passage of time. Generally the evidence of most witnesses was consistent with that of other witnesses in relation to the material facts.

[9] I was not convinced by one part of Mr Thompson's evidence, namely that he was unaware that Mr MacKinnon had been planning to use an independent loader and that had he been he would have warned him about the risks of overhead cables. This did not sit well with the rest of his evidence from which it was clear that the arrangements between Mr Thompson and Mr MacKinnon were casual in the extreme. Nor did it sit well with the evidence of Mr Nixon whose position was that hauliers were discussed at the pre commencement meeting but only in so far as Mr Thomson said he did not know at that stage which haulier he was planning to use.

[10] To be fair to Mr Thompson, I got the impression that he, like a number of witnesses, was understandably still upset by the death of a well liked and highly respected business contact with whom he had worked before. He gave the impression of having gone over in his mind the details of the incident time and time again and

given the passage of almost 2 years since the accident it is perhaps not surprising that his mind has tried to fill in the gaps. I did not feel he was trying in any way to mislead the court.

Pre commencement meeting

[11] Having a pre commencement meeting is a requirement so that the various contractors are aware of health and safety and other issues before work starts. It seemed to me, and I think was accepted by most witnesses who spoke about it, that this was not a robust meeting and did not achieve the required result. It seemed that perhaps lip service was being paid to the requirement, in some respects at least, rather than it being used as an opportunity for all parties to clarify responsibilities and duties. Had there been a robust conversation at this meeting it would have been obvious to all that different people had different understandings of who was responsible for what. Mr Thompson was adamant in his evidence that the landowner was responsible for the erection of goalposts and warning signs and he was responsible only for health and safety on the work site.

[12] Mr MacKinnon was not present at the meeting. That may well have been because the haulage contractor had not yet been identified. In any event Mr Thompson seemed to rely on the fact that Mr MacKinnon was very experienced and he thought that he had worked on the Kyle Farm site before (which he himself had not). This casual attitude may simply reflect how business between the two gentlemen was generally conducted. However, relying on the experience and knowledge of any contractor rather than considering the actual risks on each and every occasion may have led to complacency. Even if someone has experience and knowledge of the site, it should be refreshed. Assuming that the other person already has a detailed knowledge of the risks is not sufficient and there should always be robust discussions.

Goalposts

[13] It was clear that there had been considerable confusion about who was responsible for the erection of the goalposts and warning signage before the accident.

Unfortunately that confusion appears still to exist. Despite detailed investigations being carried out following the accident witnesses still came out with different views as to who has those responsibilities.

[14] Mr Thompson still thought it was the landowner (The Forestry Commission) who had the responsibility. Mr Nixon thought it was the responsibility of the Forest Works Manager, Mr Thompson. Mr Fryer, Area Operations Manager of the Forestry Commission, thought it was the Forestry Commission's responsibility on any part of the road (whether access road or works road) but if on part of the work site (not on any part of the road) it was the responsibility of the Forest Works Manager. Ms Ramsay, Head of Safety, Health and Environment at the Forestry Commission thought the accident took place on the work site (albeit on a part of the road which was within the work site) and was therefore the responsibility of the Forest Works Manager. Mr Miller, Principal Inspector with HSE, appeared to consider that the Forestry Commission had taken responsibility for both the access road and the work site.

[15] It seems to me that the confusion arises largely when an access track adjoins or is part of a work site. It seemed to be agreed by all parties that SSE had no responsibilities on Kyle Farm at the time in question. It also appeared to be agreed that the access track up to where the work site started was the responsibility of the landowner. It also appeared to be agreed that within the actual work site the Forest Works Manager had the responsibility. That makes sense as, as operations progress, the landowner would not necessarily be aware where exactly the harvesting is taking place and what parts of the work site will be near to overhead power lines.

[16] Where there is significant confusion is where overhead lines cross an existing access track which is in or adjacent to an area where work is being carried out. It is disappointing that even now this confusion exists. This matter could and should be resolved at the pre commencement meeting, which all interested parties should attend, and where there should be a clear and robust discussion as to who is taking responsibility for the erection of signage and goalposts on every part of the site. It goes without saying that a written record should be made of the meeting which should be copied to all relevant parties.

[17] The evidence from Ms Ramsay and Mr Fryer makes it clear that the Forestry Commission have changed their practice following this accident. Old legacy utility poles or goalposts will now be replaced with ones which meet the correct current standards or the commission will ensure that the Forest Works Manager does that. Training is being provided by HSE to employees and other stakeholders.

[18] Evidence was led from Niall Miller, HSE Principal Inspector, from which it was clear that current industry standards require goalposts to be made of timber or plastic and have a fixed solid bar if feasible (if the gap is too wide this may not be possible). They should be highlighted in a luminescent colour or in red and white. His position was that the landowner's duties include supplying information in relation to risk to the forest works manager then the forest works manager should pass it down the supply chain. He said that everyone has some responsibility, including haulage contractors and no-one should be working on a site they deem to be unsafe and anyone with concerns should raise them with those who have the ability to rectify them. There should be more robust sharing of work, good sharing of information, better co-operation and goalposts should be installed to HSE guidance standards.

[19] It seems to me that if only one lesson is to be learnt from this tragic accident, it is that, following the pre commencement meeting, everyone should be absolutely clear about who is responsible for what.

The vehicle

[20] The vehicle was called an independent loader by some witnesses and a lorry mounted timber crane by others. The jib was referred to variously as jib, boom and crane by different witnesses.

[21] Mr Simpson, Principal Specialist Inspector (Mechanical Engineering) with HSE, examined the burnt out vehicle after it had been removed from the site. He comprehensively described the workings and functionality of such a vehicle to the court. He concluded (1) that the vehicle was suitable for the forestry environment, (2) the crane was not stowed but had it been it would not have struck the power line and (3) the width and gradient of the track was suitable for the vehicle.

[22] It was unclear to Mr Simpson whether this vehicle contained any warning light to alert the driver to the fact that the jib was still extended when he moved the lorry because the extensive fire damage to the vehicle made it impossible for him to see whether such an alarm had been fitted or not. He could find no evidence of sensors but they are made of nylon and could have melted. He made enquiries with the company who had modified the lorry and sold it to Skye Transport. They were unable to assist. His opinion was that a vehicle of this type and age should have had such a warning alarm fitted in terms of British and European standard BEN12999:2002.

[23] On the basis that it is not clear whether it had such a device or not it is not appropriate to suggest that it would have been a reasonable precaution which might have prevented the accident in terms of s6(1)(c).

[24] I was however invited by the Crown to include this under s 6(1)(e) which I agree is appropriate. It seems to me that as these vehicles are sometimes moved a short distance with the jib extended (on flat ground for very short distances, for example at a port), it would not be feasible to have a function which prevented any movement at all unless there was an over-ride function. However the fitting of an appropriate alarm would be relatively straightforward and would at the very least provide a driver with a reminder.

Mobile Phone Cover

[25] There was evidence from a number of witnesses that mobile cover in the area of Kyle Farm was, at best, patchy. The evidence from Vodafone's records and from other witnesses suggested that Mr MacKinnon was trying to make contact with the final driver around the time of the accident. It was suggested that this may have been the reason why he moved the vehicle; to try and find cover. While clearly no-one can know exactly what was in Mr MacKinnon's mind and this is therefore speculation, it does seem probable.

Cause of death

[26] It is clear that Mr MacKinnon attempted to leave the vehicle after it went on fire but on doing so was electrocuted.

[27] Mr Madden gave a very clear and helpful account of the course of events which would have arisen following the crane touching the power line. He also explained how the power company would have dealt with the alarm which would have been raised in their control room in circumstances such as this and the decision making process that would have been followed, balancing the need to keep customers on supply while also providing a protective system. He explained the timings of the accident which he took from the SSE report and explained how he came to the conclusion that the jib hit the power line at around 12.29 and that the ground would have been live for the subsequent 162 seconds. There was no criticism whatsoever of the power company's actions.

[28] The Procurator fiscal depute submitted that it would be helpful if the evidence from Mr John Madden, retired specialist inspector with HSE, in relation to how best to deal with a situation where a vehicle comes into contact with high voltage power lines could be included in the determination. This situation could arise, not just in a forestry or construction situation but also if, for example, power lines were brought down by a storm on top of a vehicle. Accordingly I have done so in terms of s 6(1)(e). Mr Madden's evidence was clear and compelling and his evidence to the enquiry in this connection is repeated as it was given.

Conclusion

[29] In conclusion it appears that, tragically, Mr MacKinnon decided to move his vehicle a relatively short distance along a forest track with the jib of the crane extended. The jib struck high voltage power lines causing the vehicle to catch fire and the ground around it to become electrified. Mr MacKinnon then exited the vehicle and was electrocuted. Whether Mr MacKinnon forgot that he had the jib extended on what was a newly acquired crane, forgot about the existence of the power cables overhead or mistook the height of the jib or the cables will never be known. It seems

likely that he moved the vehicle in order to find better mobile phone coverage but that is to some extent speculation.

[30] Given the circumstances there was absolutely nothing that anyone coming across the scene of the accident could have done to save Mr Mackinnon's life. Mr Catchpole, who was first on the scene, acted entirely appropriately by retreating from the thick smoke and calling the emergency services. From the evidence of Mr Madden it was clear that had he not done so he may well have been electrocuted himself and in any event any efforts to save Mr MacKinnon would by that stage have been completely futile. Likewise nothing would have been gained by any of the emergency services' personnel putting themselves at greater risk by approaching any closer to the vehicle than they did before the area was made safe by the power company specialist engineers.

[31] At the end of the inquiry I extended my condolences to Mr MacKinnon's family, some of whom who sat through what must have been some difficult and harrowing evidence during the inquiry. I was joined in that by the procurator fiscal depute and the solicitor for the Forestry Commission. I would wish formally to repeat those condolences in this determination.