

<p>1 Wednesday, 28 November 2018</p> <p>2 (10.00 am)</p> <p>3 SIR MARTIN MOORE-BICK: Good morning, everyone. Welcome to</p> <p>4 today's hearing.</p> <p>5 Today we are going to hear from the inquiry's expert</p> <p>6 on cause and origin of the fire.</p> <p>7 Yes, Mr Kinnier.</p> <p>8 MR KINNIER: Thanks, sir. May I call Professor Niamh</p> <p>9 Nic Daeid.</p> <p>10 SIR MARTIN MOORE-BICK: Thank you</p> <p>11 PROFESSOR NIAMH NIC DAEID (affirmed)</p> <p>12 Questions by MR KINNIER.</p> <p>13 SIR MARTIN MOORE-BICK: Thank you very much, professor. Sit</p> <p>14 down and make yourself comfortable there.</p> <p>15 THE WITNESS: Thank you very much.</p> <p>16 SIR MARTIN MOORE-BICK: Yes, Mr Kinnier.</p> <p>17 MR KINNIER: Thank you, sir.</p> <p>18 First of all, would you please confirm your name for</p> <p>19 the record.</p> <p>20 A. My name is Niamh Sinead Nic Daeid.</p> <p>21 Q. Professor, thank you very much for coming today to give</p> <p>22 evidence. It's much appreciated.</p> <p>23 You've provided two reports: a preliminary report</p> <p>24 dated 29 March this year and a final report dated</p> <p>25 1 November of this year; is that right?</p> <p style="text-align: center;">Page 1</p>	<p>1 and the experience relevant to the matters you're</p> <p>2 dealing with in this inquiry.</p> <p>3 I'm not going to go through this, but would like to</p> <p>4 pick out the following details with you.</p> <p>5 First of all, you are currently the director of the</p> <p>6 Leverhulme Research Centre for Forensic Science; is that</p> <p>7 right?</p> <p>8 A. That's correct.</p> <p>9 Q. You have held the chair in forensic science at the</p> <p>10 University of Dundee since 2014.</p> <p>11 A. Correct.</p> <p>12 Q. Between 2011 and 2014, you held the chair in forensic</p> <p>13 science at the University of Strathclyde?</p> <p>14 A. Yes, that's correct.</p> <p>15 Q. In 2017, you become a Chartered Chemist.</p> <p>16 A. Yes.</p> <p>17 Q. As to fellowships, you're a fellow of a number of</p> <p>18 learned societies, primarily the Royal Society of</p> <p>19 Edinburgh --</p> <p>20 A. Yes, that's correct.</p> <p>21 Q. -- the Royal Society of Chemistry --</p> <p>22 A. Yes.</p> <p>23 Q. -- the Chartered Society for Forensic Science --</p> <p>24 A. Yes.</p> <p>25 Q. -- and the Institute of Chemistry of Ireland.</p> <p style="text-align: center;">Page 3</p>
<p>1 A. That's correct, yes.</p> <p>2 Q. We dealt with the preliminary report when you gave</p> <p>3 evidence previously, so I won't rehearse those matters</p> <p>4 again, but is it right that your final report sets out</p> <p>5 you are final conclusions regarding (a) the cause and</p> <p>6 origin of the initial fire within flat 16 on</p> <p>7 14 June 2017, and (b) the spread of the fire once</p> <p>8 ignited within the flat itself?</p> <p>9 A. That's correct, yes.</p> <p>10 Q. In terms of your final report, are the factual matters</p> <p>11 you've set out there true to the best of your knowledge</p> <p>12 and belief?</p> <p>13 A. To the best of my knowledge and belief, yes.</p> <p>14 Q. Does your final report set out your opinions in relation</p> <p>15 to the matters relevant to this inquiry?</p> <p>16 A. Yes, it does.</p> <p>17 Q. Finally, you've provided this report in the same way you</p> <p>18 would've done had it been a report for a court of law;</p> <p>19 is that right?</p> <p>20 A. That's correct, yes.</p> <p>21 Q. Thank you.</p> <p>22 Professor, if we could first deal with your</p> <p>23 qualifications and background.</p> <p>24 For people's reference, in section 3, page 4 of your</p> <p>25 final report and appendix 2, you outline your background</p> <p style="text-align: center;">Page 2</p>	<p>1 A. Yes.</p> <p>2 Q. Amongst other prizes you've been awarded during your</p> <p>3 career, in 2018 is it right that you were awarded the</p> <p>4 Distinguished Forensic Scientist Award by the European</p> <p>5 Network of Forensic Science Institutes?</p> <p>6 A. That's correct, yes.</p> <p>7 Q. In 2016, you were awarded the Pete Ganci award for</p> <p>8 service to fire investigation by the UKAFI; is that</p> <p>9 right?</p> <p>10 A. That's correct.</p> <p>11 Q. Can you help us, what does UKAFI stand for?</p> <p>12 A. It stands for the UK Association of Fire Investigators.</p> <p>13 It is the professional body for fire investigators in</p> <p>14 the UK.</p> <p>15 Q. In relation to your other professional relevant</p> <p>16 experience, is it right that you're currently the vice</p> <p>17 chair of the scientific advisory board of the</p> <p>18 International Criminal Court?</p> <p>19 A. Yes, that's true.</p> <p>20 Q. Between 2013 and 2016, you were the chair of Interpol's</p> <p>21 Forensic Science Managers Symposium.</p> <p>22 A. Correct.</p> <p>23 Q. Between 2012 and 2015, you were the chair of the ENFSI</p> <p>24 investigation working group; is that right?</p> <p>25 A. It was the fire investigation working group of ENFSI,</p> <p style="text-align: center;">Page 4</p>

<p>1 which is the European Network of Forensic Science</p> <p>2 Institutes.</p> <p>3 Q. Is it right you are the committee lead in the</p> <p>4 development of the UK national code of practice for fire</p> <p>5 scene investigations?</p> <p>6 A. Yes, that's true.</p> <p>7 Q. Finally, you're a member of the steering committee for</p> <p>8 the development and publication of judicial primers.</p> <p>9 A. Yes.</p> <p>10 Q. That involves what, exactly?</p> <p>11 A. The judicial primers are a project led by the senior</p> <p>12 judiciary in England and Wales, so by the Lord Chief</p> <p>13 Justice of England and Wales, in collaboration with the</p> <p>14 two national academies, the Royal Society and the Royal</p> <p>15 Society of Edinburgh, and the role of the primers is to</p> <p>16 present the known position for a scientific discipline,</p> <p>17 DNA, for example, written by the leaders in the field,</p> <p>18 and ratified by the councils of the national academies,</p> <p>19 in order to facilitate an understanding by the judiciary</p> <p>20 of what the current accepted science in that particular</p> <p>21 area is.</p> <p>22 Q. Professor, thank you.</p> <p>23 Before I turn to examination on the topics contained</p> <p>24 in your final report, I should give a general warning to</p> <p>25 those in the room and watching elsewhere that a number</p> <p style="text-align: center;">Page 5</p>	<p>1 side, and then the living room to the north of the</p> <p>2 kitchen.</p> <p>3 A. Correct.</p> <p>4 Q. If we can now look at the layout of the kitchen of</p> <p>5 flat 16. If we can turn to figure 13 on page 26.</p> <p>6 First of all, just to confirm, that's your</p> <p>7 approximation of the likely internal layout of the</p> <p>8 kitchen in flat 16; is that right?</p> <p>9 A. Yes, that's correct.</p> <p>10 Q. If you could enable us to understand, what evidence have</p> <p>11 you relied upon for placing the various appliances where</p> <p>12 they are identified in this plan?</p> <p>13 A. The different appliances and their positions were</p> <p>14 presented in the diagram on the basis of witness</p> <p>15 testimony from Mr Kebede and from the other occupants of</p> <p>16 the flat, and also from the contemporaneous notes of the</p> <p>17 the fire investigators, and also, finally, from the</p> <p>18 information that was available within the thermal</p> <p>19 imaging camera videos of the first firefighters that</p> <p>20 went in.</p> <p>21 The final aspect of it was looking at the</p> <p>22 photographs that were taken by the first fire</p> <p>23 investigators who documented the scene.</p> <p>24 Q. In your report, you advance three hypotheses. Just so</p> <p>25 people are aware of what those are, hypothesis 1 is that</p> <p style="text-align: center;">Page 7</p>
<p>1 of the photographs within your report that we will be</p> <p>2 looking at during the course of this morning will show</p> <p>3 images of burnt-out scenes, and some people may find</p> <p>4 these distressing.</p> <p>5 When I come up to particular photos, I shall</p> <p>6 endeavour to give a warning. But at the outset, could</p> <p>7 I make that general note for everyone watching.</p> <p>8 Professor, the first topic I'd like to cover with</p> <p>9 you is really in order to orientate everyone as to what</p> <p>10 the layout of the flat is.</p> <p>11 First of all, if I could ask Ralph to draw up</p> <p>12 page 25 of your final report, the reference to which is</p> <p>13 NNDS00000001, and that is figure 11.</p> <p>14 First of all, the flat 16 mark there in red in the</p> <p>15 top right-hand corner, that identifies flat 16; is that</p> <p>16 right?</p> <p>17 A. Yes, that's right.</p> <p>18 Q. On the same page -- Ralph, if we can go to figure 12 --</p> <p>19 this is a plan that you've drawn, I think, of flat 16</p> <p>20 itself.</p> <p>21 A. It's a plan that I've taken from the previous figure and</p> <p>22 annotated so that I've labelled up the different rooms</p> <p>23 in the flat.</p> <p>24 Q. As we see, we have the kitchen in the bottom right-hand</p> <p>25 corner, the kitchen window identified on the far right</p> <p style="text-align: center;">Page 6</p>	<p>1 the fire in the tower started in the kitchen of flat 16</p> <p>2 as opposed to any other flat in the tower; is that</p> <p>3 right?</p> <p>4 A. Yes, that's correct.</p> <p>5 Q. Hypothesis 2 is that the fire started in the south-east</p> <p>6 end of the kitchen of flat 16 as opposed to elsewhere</p> <p>7 within the kitchen.</p> <p>8 A. Correct.</p> <p>9 Q. When we talked about the south-east end, what we're</p> <p>10 talking about is the end where the kitchen window,</p> <p>11 approximate position of the extractor fan, the tall</p> <p>12 fridge freezer, the cooker end of the kitchen.</p> <p>13 A. Yes, that's correct.</p> <p>14 Q. Finally, hypothesis 3 is that it's more likely than not</p> <p>15 that the fire started on the south-east corner in the</p> <p>16 tall fridge freezer as opposed to any other appliance or</p> <p>17 item in the south-east corner of the kitchen of flat 16.</p> <p>18 A. Correct.</p> <p>19 Q. Thank you.</p> <p>20 If we can first turn to hypothesis 1.</p> <p>21 Ralph, if I could ask you to show Professor</p> <p>22 Nic Daeid paragraph 8.8.11, which is at page 66 of the</p> <p>23 final report.</p> <p>24 Here you state your conclusion that, and I quote:</p> <p>25 "8.8.11. All of the witness statements from the</p> <p style="text-align: center;">Page 8</p>

<p>1 fire fighters, fire service personnel and occupants of 2 flat 16 provide strong evidence that the fire in 3 Grenfell Tower on the 14th June 2017 started in the 4 kitchen of flat 16."</p> <p>5 My first question is: does that remain your view?</p> <p>6 A. Yes, it does.</p> <p>7 Q. Can we look briefly at the evidence upon which you've 8 relied in reaching this conclusion.</p> <p>9 The first category of evidence is the evidence of 10 Mr Kebede and the other two occupants of flat 16; is 11 that a fair summary?</p> <p>12 A. Yes, that is.</p> <p>13 Q. Could I ask Ralph to put up on the screen 14 paragraph 8.2.2 at page 23 of the final report.</p> <p>15 Here you set out the relevant extracts from a 999 16 call made by Mr Kebede at 00.54; is that right?</p> <p>17 A. Yes.</p> <p>18 Q. Where he says there, "fire in flat 16, Grenfell Tower" 19 and "the fridge, flat 16 Grenfell Tower". That's the 20 evidence upon which you've relied from that phone call.</p> <p>21 A. Yes. It was the first phone call that was, to my 22 knowledge, recorded by the London Fire Brigade.</p> <p>23 Q. Thank you.</p> <p>24 Ralph, if you could put that amplification down and 25 take us to page 65, first of all, of the final report.</p> <p style="text-align: center;">Page 9</p>	<p>1 kitchen of flat 16 at approximately 01.14 and described 2 the temperature change to be significant. Thereon you 3 see the evidence quoted.</p> <p>4 If you could de-amplify that, Ralph, and identify 5 the paragraph 8.5.13, you have the evidence of 6 Firefighter Daniel Brown, who describes flame within 7 flat 16.</p> <p>8 A. That's correct, yes.</p> <p>9 Q. If that could be de-amplified, Ralph, and if you could 10 amplify paragraph 8.5.19 on page 35.</p> <p>11 You summarise the evidence of Firefighters O'Hanlon 12 and Barton, but primarily O'Hanlon, in which they 13 identify the scene that they witnessed when they 14 attended flat 16; is that right?</p> <p>15 A. Yes. I think the sequence here is important. So when 16 the first firefighters, Batterbee and Brown, entered the 17 flat, they searched the flat initially, and the only 18 place where they found evidence of burning was in the 19 kitchen, having searched the rest of the property.</p> <p>20 Q. If I could stop you there, it may help you, professor -- 21 Ralph, could you de-amplify page 35 and go back to 22 page 31.</p> <p>23 On this page, essentially you set out the key 24 relevant evidence that you've relied upon for the 25 initial stages of the very first, first responders'</p> <p style="text-align: center;">Page 11</p>
<p>1 Here, at paragraphs 8.8.5 onwards, and turning over 2 the page to page 66, is it right you've set out what you 3 considered to be the relevant extracts from the witness 4 statements of the former occupants of flat 16 which are 5 pertinent to hypothesis 1?</p> <p>6 A. Yes.</p> <p>7 Q. Can you draw out for us what you consider to be the key 8 elements of the evidence upon which you've relied?</p> <p>9 A. The key elements here are the witness's statement 10 relating to what he saw once the smoke alarm in the flat 11 woke him up. So he reports, having gone into his 12 kitchen or looked inside the kitchen, what he saw in 13 regards to smoke within the kitchen area, and then his 14 direct actions following that observation, which was to 15 wake the other people in the flat and to exit the flat 16 to try to wake up his neighbours and also to call the 17 fire service.</p> <p>18 Q. The second category of evidence you rely upon is the 19 evidence of the first responders; is that a fair 20 summary?</p> <p>21 A. Yes.</p> <p>22 Q. If I could ask Ralph to take us to page 31 of your final 23 report, and paragraph 8.5.11, here you summarise the 24 evidence of Crew Manager Charles Batterbee, in which he 25 said he opened the door to the right leading into the</p> <p style="text-align: center;">Page 10</p>	<p>1 search?</p> <p>2 A. That's correct.</p> <p>3 Q. The third category of evidence you cite in the report is 4 the footage from the thermal image cameras held by the 5 first responders; is that right?</p> <p>6 A. Yes.</p> <p>7 Q. Ralph, if I can ask you to turn to page 32 of the report 8 and, in particular, figure 19.</p> <p>9 Professor, I think we dealt with these stills when 10 you gave evidence back in June, but I think it would be 11 useful if you could talk us through (a), (b) and (c) in 12 that order, what they show and what you derive from 13 them.</p> <p>14 A. So what you're looking at is on the left-hand side of 15 the photographs is an unmarked-up image. That's the 16 image that was directly taken from the thermal imaging 17 camera. On the right-hand side, corresponding to each 18 of those photographs, so for (a), (b) and (c), I've 19 placed what I believe to be the positioning of some of 20 the appliances that were within the kitchen.</p> <p>21 If we take photograph (a) first, or the two 22 photographs connected with (a) first, this was the 23 thermal image captured by the TIC when the firefighters 24 opened the kitchen door for what we understand to be the 25 first time. So that was at 01.14, according to the</p> <p style="text-align: center;">Page 12</p>

<p>1 times that we have agreed.</p> <p>2 What you see is, looking down the photograph --</p> <p>3 perhaps if I can stand up.</p> <p>4 SIR MARTIN MOORE-BICK: Please do.</p> <p>5 A. It might be easier.</p> <p>6 So what you see on the first photograph, this</p> <p>7 is looking from the kitchen door, this I believe to be</p> <p>8 the edge of the door (Indicates) --</p> <p>9 MR KINNIER: Professor, if I could just stop you there, for</p> <p>10 the transcript, what you're pointing to is figure 19A at</p> <p>11 the top left-hand photo.</p> <p>12 A. Yes.</p> <p>13 MR KINNIER: Thank you.</p> <p>14 A. So the bit I believe to be part of the door is the black</p> <p>15 line on the right-hand side of the photograph. As you</p> <p>16 look down into the room, you see a yellow glow down</p> <p>17 towards the end. Thermal imaging cameras show different</p> <p>18 temperatures by changing the colour. So while it looks</p> <p>19 like a yellow glow, that doesn't necessarily mean it's</p> <p>20 a flame, it simply means it is a higher temperature.</p> <p>21 So as you look down the room, this is what the</p> <p>22 firefighters would have seen.</p> <p>23 My interpretation of some of the somewhat grainy</p> <p>24 images within the photograph is that here (Indicates),</p> <p>25 which is about the middle of the photograph, there's</p> <p style="text-align: center;">Page 13</p>	<p>1 placed some of the appliances in terms of where I have</p> <p>2 interpreted them to be.</p> <p>3 Q. Your interpretation of the location of the appliances is</p> <p>4 shown in the middle right-hand box?</p> <p>5 A. That's correct.</p> <p>6 Q. Professor, if I could ask you to turn to the bottom two</p> <p>7 images, so figure 19(c), what does the bottom left-hand</p> <p>8 image show us?</p> <p>9 A. Again, this is the third opening of the door. So in</p> <p>10 between each, the firefighters close the door, waited</p> <p>11 a small amount of time and then re-opened them. This</p> <p>12 was about a minute after the images of figure (b).</p> <p>13 Here the firefighters are looking at the fire at the</p> <p>14 end of the room from a different angle. So we're no</p> <p>15 longer looking directly along, we're now looking upwards</p> <p>16 into the corner. So what you're seeing is the top of</p> <p>17 the appliances as opposed to the entire length of the</p> <p>18 appliance or as much of the length as we can see. So</p> <p>19 we're looking up into the top corner, if you like, or</p> <p>20 top portion of the room.</p> <p>21 The black line on the right-hand side is, again, the</p> <p>22 door of the kitchen, and my interpretation of where the</p> <p>23 tall fridge freezer is is indicated on figure (c) to the</p> <p>24 right.</p> <p>25 Q. I'm grateful for that.</p> <p style="text-align: center;">Page 15</p>
<p>1 an almost shaded, rounded area with an outline around</p> <p>2 it, which I interpret to be the washing machine, and</p> <p>3 then beside it a tall object that's blocking the</p> <p>4 increased colour, if you like, on the TIC, which</p> <p>5 I believe to be the fridge freezer.</p> <p>6 Q. If we look at the top right-hand image, you have there</p> <p>7 drawn in a dotted red line what you consider to be the</p> <p>8 tall fridge freezer and, next to it, the washing</p> <p>9 machine; is that right?</p> <p>10 A. Yes. Now, we know that the washing machine and the tall</p> <p>11 fridge freezer weren't beside each other, but as you</p> <p>12 look down the room, the positioning of the various</p> <p>13 appliances are distorted slightly just in terms of how</p> <p>14 you viewed the room.</p> <p>15 Q. If we can now move down to figure 19(b), what does the</p> <p>16 middle left-hand photo show us?</p> <p>17 A. So in figure 19, we've now moved on by about 15 seconds</p> <p>18 only, so this was the second opening of the door by the</p> <p>19 firefighters. Again, you're looking from the doorway,</p> <p>20 they haven't entered the room yet, and you're looking</p> <p>21 down towards the window end of the property, or the</p> <p>22 kitchen.</p> <p>23 What you can observe is that the temperature has</p> <p>24 increased, or at least the spread of the temperature has</p> <p>25 increased from the previous photograph, and, again, I've</p> <p style="text-align: center;">Page 14</p>	<p>1 Professor, if you wouldn't mind staying standing.</p> <p>2 Ralph, if you wouldn't mind turning to page 34 and</p> <p>3 figure 21.</p> <p>4 Professor, again, if we could go through each of</p> <p>5 these images.</p> <p>6 First of all, though, a general question: what do</p> <p>7 these images show?</p> <p>8 A. These images are now -- the firefighters have now moved</p> <p>9 into the kitchen, so these are no longer from the</p> <p>10 doorway, they've moved into the kitchen, and while one</p> <p>11 of the firefighters -- I believe it to be</p> <p>12 Firefighter Batterbee -- was tackling the fire in the</p> <p>13 fridge freezer, Firefighter Brown was looking at the</p> <p>14 rest of the window end of the kitchen using the thermal</p> <p>15 imaging camera, and that's what these images depict.</p> <p>16 Q. Thank you.</p> <p>17 I interrupted you. If we could start in the top</p> <p>18 left hand corner, we have figure 21(a), what does this</p> <p>19 image show us, in your interpretation?</p> <p>20 A. Figure 21(a) is looking at the top west-hand corner of</p> <p>21 the kitchen window. So the large kitchen window is on</p> <p>22 this side, on the left-hand side; the smaller kitchen</p> <p>23 window with the infill panel above it with the extractor</p> <p>24 fan is on the right-hand side. What this photograph is</p> <p>25 showing is the thermal imaging camera's image of just</p> <p style="text-align: center;">Page 16</p>

<p>1 what was happening around that area just after the 2 firefighters had entered the room, so about a minute 3 after the firefighters had entered the room. 4 Q. If we move over looking at (b), again, it's an image of 5 the kitchen window, I think. 6 What can be seen through that window, in your view? 7 A. So the images here are -- some of them are replicants of 8 each other. This one (Indicates) is showing you now 9 where the edge of the window frame is, and what appears 10 to be in evidence is materials dropping down across the 11 window, on the outside of the window. 12 Q. Again, is it much the same view that's identified in the 13 stills at (c), (d) and (e)? 14 A. Yes. 15 Q. Professor, thank you very much. 16 Ralph, you can put those down. 17 Professor, it looks from your report that the fourth 18 category of evidence you've relied upon is footage 19 actually taken by Mr Kebede himself; is that right? 20 A. Yes. 21 Q. If I could ask Ralph to put up page 39 of your final 22 report and figure 25. 23 First of all, can you confirm for us what these 24 shots are? 25 A. These are still images taken from video material that</p> <p style="text-align: center;">Page 17</p>	<p>1 out what appears to be debris falling from the window. 2 Q. Thank you. 3 Ralph, you can put that image down now. 4 Professor, the fifth and final category of evidence 5 you appear to rely upon for reaching your conclusions in 6 respect of hypothesis 1 appears to be the evidence of 7 the occupant of flat 9; is that correct? 8 A. Yes. 9 Q. Ralph, if I could ask you to go to page 66 of the final 10 report, and paragraph 8.8.9, and could that be 11 amplified. 12 That paragraph reads thus: 13 "8.8.9. Flat 9 on the third floor of Grenfell Tower 14 was also damaged by fire. Flat 9 can be ruled out as 15 the area of origin of the first fire in Grenfell Tower 16 because the occupant of flat 9 spoke to the fire service 17 at 01:36:23 which was after the initial contact by 18 Mr Behailu KEBEDE ... The occupier of flat 9 was 19 reported as stating that; 20 "'.. the fire was not in her flat but there was a 21 lot of smoke' ..." 22 Am I right in thinking that's the particular extract 23 of evidence you've relied upon? 24 A. Yes, and this was important because when the fire 25 investigators at a later point examined some of the</p> <p style="text-align: center;">Page 19</p>
<p>1 was recovered from Mr Kebede's mobile telephone, and 2 they are taken from outside of Grenfell Tower. Looking 3 up towards flat 16. 4 Q. Can you help us, what can you deduce from these 5 screenshots? 6 A. So the videos follow a sequence, as you can see by the 7 timing, and really what I was trying to capture was just 8 the development of the fire around about the window of 9 the kitchen of flat 16. 10 What appears to be happening is that the area around 11 where the extractor fan is appears to be burning, and 12 that as that burning is progressing, the fire is exiting 13 or beginning to exit outside of the kitchen of flat 16. 14 Q. The kitchen extractor fan, if we look at (c), am I right 15 in understanding it's identified by the large white 16 arrow? 17 A. That's correct. 18 Q. If we move along to the screenshot at (e), which is 19 timed at 01.08.18, what does the top arrow indicate? 20 A. The top arrow is -- my interpretation of the photograph 21 is that it's indicating flames now starting to come out 22 from the window on the right-hand side of the window as 23 you look up. 24 Q. And the middle arrow? 25 A. The middle arrow and the arrow beneath it are pointing</p> <p style="text-align: center;">Page 18</p>	<p>1 other flats on the floors beneath floor 4, flat 9 was 2 quite extensively damaged. It was then, therefore, 3 important to be able to rule out flat 9, because it was 4 lower, as a potential point of origin of the fire within 5 the tower. 6 This ruled that out, as far as I was concerned, 7 quite conclusively, because the occupant was in flat 9 8 after the fire had begun in flat 16. 9 Q. Have you seen any evidence since you completed your 10 report on 1 November 2018 which causes you materially to 11 alter your conclusion in respect of hypothesis 1 or 12 gives rise to an alternative hypothesis? 13 A. No. 14 Q. Turning to your conclusion and the strength of your 15 confidence in relation to your conclusion on 16 hypothesis 1, put simply, would you say it was certain, 17 probable or likely that the initial fire started in the 18 kitchen of flat 16? 19 A. In my view, it was certain. 20 Q. Thank you. 21 Professor, we're now going to turn to hypothesis 2, 22 and that's the location within the kitchen where you 23 consider the initial fire started. 24 Ralph, could I ask you to turn to page 68 of the 25 final report and paragraph 8.8.16.</p> <p style="text-align: center;">Page 20</p>

5 (Pages 17 to 20)

<p>1 Professor, you set out there and I quote:</p> <p>2 "8.8.16. The evidence of the fire fighters and the</p> <p>3 images from the thermal camera indicate that it is more</p> <p>4 likely than not that the area of origin of the fire was</p> <p>5 in the southeast area of the kitchen in flat 16. This</p> <p>6 is illustrated in figure 56 and photographically in</p> <p>7 figure 57."</p> <p>8 First of all, does that remain your view?</p> <p>9 A. Yes.</p> <p>10 Q. If I could ask Ralph to turn to page 69 and figure 56,</p> <p>11 first of all.</p> <p>12 We've looked at this earlier, but do you confirm</p> <p>13 that that is the layout of the kitchen, and at the</p> <p>14 south-east end --</p> <p>15 A. Yes.</p> <p>16 Q. -- shaded red, is the area of origin?</p> <p>17 A. Yes.</p> <p>18 Q. Thank you. If we could turn --</p> <p>19 A. Could I just clarify that?</p> <p>20 Q. Sorry.</p> <p>21 A. I think that the shaded red area I would say contains</p> <p>22 the area of origin.</p> <p>23 Q. Thank you.</p> <p>24 Before I go to the next photo, I should give</p> <p>25 a warning that people may find it distressing. It shows</p> <p style="text-align: center;">Page 21</p>	<p>1 Q. -- the sink --</p> <p>2 A. Yes.</p> <p>3 Q. -- and in the corner, next to the sink, immediately next</p> <p>4 to it, we have the possible kettle.</p> <p>5 A. Yes.</p> <p>6 Q. And against the far right-hand wall, the microwave?</p> <p>7 A. That's correct.</p> <p>8 Q. Thank you.</p> <p>9 As with hypothesis 1, can I now turn to the evidence</p> <p>10 you've relied upon for reaching your conclusion in</p> <p>11 respect of hypothesis 2.</p> <p>12 Again, the first source of evidence relied upon</p> <p>13 appears to be the evidence of Mr Kebede; is that a fair</p> <p>14 summary?</p> <p>15 A. Yes, that would be fair.</p> <p>16 Q. Ralph, if I could ask you to turn to page 65 of the</p> <p>17 final report, and paragraph 8.8.5.</p> <p>18 I'll read this out. You say there, and I quote:</p> <p>19 "8.8.5. Mr Behailu KEBEDE ... who occupied flat 16</p> <p>20 at Grenfell Tower reports that he was awakened by the</p> <p>21 smoke alarm in his kitchen. He went into the kitchen</p> <p>22 via the main door (this was the door from the hallway)</p> <p>23 and stated that;</p> <p>24 "I could see light coloured smoke in the area next</p> <p>25 to the fridge/freezer and window. It was in the general</p> <p style="text-align: center;">Page 23</p>
<p>1 the scene of the kitchen after the fire.</p> <p>2 Ralph, could I ask you to turn to figure 57 at</p> <p>3 page 69.</p> <p>4 This is a photograph of the kitchen, and the area</p> <p>5 that contains the area of origin is again shaded red; is</p> <p>6 that right?</p> <p>7 A. That's correct, yes.</p> <p>8 Q. So people can understand the location of matters,</p> <p>9 starting at the far left-hand side we have the kitchen</p> <p>10 window.</p> <p>11 A. Yes.</p> <p>12 Q. Then in the foreground we have the old freezer.</p> <p>13 A. Yes.</p> <p>14 Q. And below it, the small fridge.</p> <p>15 A. Correct.</p> <p>16 Q. Behind it, we have the tall fridge freezer.</p> <p>17 A. Yes.</p> <p>18 Q. As we move rightwards, we have the cooker --</p> <p>19 A. Yes.</p> <p>20 Q. -- a bin --</p> <p>21 A. Yes.</p> <p>22 Q. -- a possible toaster --</p> <p>23 A. Yes.</p> <p>24 Q. -- a washing machine --</p> <p>25 A. Yes.</p> <p style="text-align: center;">Page 22</p>	<p>1 area there' 'the smoke was rising up from floor</p> <p>2 level and coming towards me' ...</p> <p>3 "and,</p> <p>4 "I saw smoke. It seemed to be coming from behind</p> <p>5 my Hotpoint fridge freezer. The smoke was approximately</p> <p>6 two thirds of the height of the fridge freezer and had</p> <p>7 reached about where the cooker was' ...</p> <p>8 "He also described the smoke as</p> <p>9 "dark', 'light dark' or 'light' in the record of</p> <p>10 interview dated 14/06/2017 ...</p> <p>11 "and,</p> <p>12 "The smoke that I saw in my kitchen was light and</p> <p>13 white in colour. I am aware that in my first and second</p> <p>14 police interviews I described the smoke as both "light"</p> <p>15 and "dark". It is important to remember that I had just</p> <p>16 had the most frightening experience of my life and was</p> <p>17 in shock. I also did not have an interpreter during</p> <p>18 these two interviews and I clearly needed one. When I</p> <p>19 said "dark", I did not mean dark in colour. I meant</p> <p>20 thick' ...</p> <p>21 "and,</p> <p>22 "The smoke by the window and the fridge side.. and</p> <p>23 underneath' ..."</p> <p>24 Is that the pertinent extracts of evidence that you</p> <p>25 relied upon in relation to your conclusions --</p> <p style="text-align: center;">Page 24</p>

6 (Pages 21 to 24)

<p>1 A. Yes, that's correct.</p> <p>2 Q. -- from Mr Kebede. Thank you.</p> <p>3 Again, the second source of evidence relied upon was</p> <p>4 the evidence of the first responders. Again, is that</p> <p>5 a fair summary, professor?</p> <p>6 A. Yes, it is.</p> <p>7 Q. Could I ask Ralph to de-amplify that and turn to page 66</p> <p>8 and paragraph 8.8.12.</p> <p>9 Here you set out the relevant extracts. First of</p> <p>10 all you summarise the evidence of Crew Manager Batterbee</p> <p>11 and Firefighter Brown, then you go on to quote</p> <p>12 Firefighter Brown.</p> <p>13 Before I deal with the quote, I think his Christian</p> <p>14 name is David as opposed to Daniel.</p> <p>15 A. Oh, I beg your pardon, yes.</p> <p>16 Q. You set out there and I quote:</p> <p>17 "I explained to CM Batterbee that we need to get</p> <p>18 right in and put it out.'</p> <p>19 "I opened the door, CM Batterbee pulsed the ceiling</p> <p>20 once more and then we moved in turning left and</p> <p>21 extinguished the fire.'</p> <p>22 "The room began to clear to a point where I could</p> <p>23 make out it was a kitchen. None of the worktops or</p> <p>24 indeed any of the remainder of the room was involved in</p> <p>25 the fire at that time. It was contained to one end,</p> <p style="text-align: right;">Page 25</p>	<p>1 in the corner opposite by the window' ...</p> <p>2 "and</p> <p>3 "The broken freezer was just a few inches from the</p> <p>4 kitchen window' ...</p> <p>5 "and Crew Manager Charles BATTERBEE ... and Fire</p> <p>6 Fighter Daniel BROWN ... also both said in their</p> <p>7 evidence to the Grenfell Tower Public Inquiry that;</p> <p>8 "... just in front of the window, there was</p> <p>9 something like a kitchen counter or board across there</p> <p>10 which he climbed up onto, which obviously you cannot see</p> <p>11 now, but it was there.' ... 'It seemed to be a worktop,</p> <p>12 a standard kitchen worktop, which was essentially in</p> <p>13 front of the window' ...</p> <p>14 "and</p> <p>15 "Fire Fighter Daniel BROWN - '... It would be that</p> <p>16 smaller fridge in the foreground in the middle' ...</p> <p>17 'That was against the wall, right below the window' ..."</p> <p>18 If I could finally ask Ralph to turn to page 35 and</p> <p>19 paragraph 8.5.19.</p> <p>20 Again, I won't go through this, but that is the</p> <p>21 evidence from Firefighter O'Hanlon that you rely upon</p> <p>22 for identifying the location of the area of origin</p> <p>23 within the kitchen of flat 16?</p> <p>24 A. Yes, that's correct, yes.</p> <p>25 Q. Thank you.</p> <p style="text-align: right;">Page 27</p>
<p>1 being to the left as you enter the room and from about</p> <p>2 2-3ft up.'</p> <p>3 "CM Batterbee pointed out that it was a fridge that</p> <p>4 he put out. This was towards the right-hand side of the</p> <p>5 back wall, sitting on something about 2-3ft up. Again,</p> <p>6 this I found a bit strange. Whilst it explained on one</p> <p>7 hand I could only see flame from 2-3 ft up in the air,</p> <p>8 it was in the wrong location to the forceful curtain of</p> <p>9 flame I saw which was more to the left of that wall.'</p> <p>10 "I walked towards the fridge to inspect it, it</p> <p>11 appeared around the top 25% of the fridge was heavily</p> <p>12 damaged, immediately I noticed little pieces of hot</p> <p>13 embers/debris falling outside what I could now see was a</p> <p>14 window that had completely given way leaving a hole in</p> <p>15 the wall.'</p> <p>16 "Below this window was a box sturdy enough to hold</p> <p>17 my weight and not involved in the fire' ..."</p> <p>18 Just for the sake of completeness, Ralph, if you</p> <p>19 de-amplify that and amplify paragraph 8.8.13 so as to</p> <p>20 provide context.</p> <p>21 Just for the sake of completeness, I'll read this</p> <p>22 out:</p> <p>23 "8.8.13. The 'box' below the window is most likely</p> <p>24 the old fridge referred to by Mr Behailu KEBEDE ...</p> <p>25 "smaller fridge was stored on top of an old freezer</p> <p style="text-align: right;">Page 26</p>	<p>1 The third source of evidence, again, I think, is the</p> <p>2 thermal imaging camera footage; is that right?</p> <p>3 A. Yes.</p> <p>4 Q. If I could ask Ralph to de-amplify that and turn to</p> <p>5 page 32, and figure 19.</p> <p>6 Again, just for the avoidance of doubt, those are</p> <p>7 the images you relied upon for identifying the area</p> <p>8 within the kitchen that you consider contains the area</p> <p>9 of origin?</p> <p>10 A. These were, but I also used the thermal imaging video</p> <p>11 that was taken after the firefighters had begun to put</p> <p>12 the fridge out, and that was because it provided very</p> <p>13 valuable information relating to the damage to the</p> <p>14 appliances to the right of where I believe the area of</p> <p>15 origin to be.</p> <p>16 Q. Tying in with that answer, it appears that the fourth</p> <p>17 piece of evidence you've relied upon is the fire</p> <p>18 patterns on the wall in the kitchen; is that right?</p> <p>19 A. Yes.</p> <p>20 Q. If I could ask Ralph to take that image down, and turn</p> <p>21 to page 69 and figure 57, which we've looked at earlier.</p> <p>22 Professor, if you could help us again, it may well</p> <p>23 be you need to retread the ground you trod in giving</p> <p>24 evidence in June explaining burn patterns and what you</p> <p>25 can learn from them.</p> <p style="text-align: right;">Page 28</p>

<p>1 A. I wonder, actually, if it would be more helpful to 2 take -- this photograph was shown earlier in my report 3 without the red line in it. It might be easier to look 4 at that one. 5 Q. I don't have the reference immediately to hand for that 6 photograph. I think it's earlier on in the report. 7 (Pause) 8 A. I can do it from this one, it's okay. 9 Q. If you go to page 24. Sorry ... 10 A. I can do it from this one, it's fine. 11 Q. Sorry, page 26, figure 14. 12 A. Perfect, yes. 13 Q. Thank you. 14 Ralph, page 26, figure 14. 15 Professor, it's probably easier if I could ask you 16 to identify what burn patterns you have relied upon for 17 the purposes of your conclusion in respect of 18 hypothesis 2. 19 A. Okay, so I'll stand also. 20 What you're looking at in terms of interpreting this 21 photograph with regards to trying to narrow down an area 22 or potential area of origin is not simply one of those 23 factors individually, it's the combination of them all 24 together, those factors being the witness statements, 25 particularly of the TIC video, and also then the</p> <p style="text-align: right;">Page 29</p>	<p>1 where the microwave is. 2 Q. So you're able to exclude -- apologies if I put this too 3 crudely, correct me if I have done that -- on the basis 4 of that, the washing machine, the possible kettle and 5 the microwave? 6 A. Yes, absolutely, because the thermal imaging camera 7 shows no damage particularly to those appliances. 8 Perhaps a bit of smoke damage, but nothing more than 9 that. And that allows us very early on, because we 10 know, because of the firefighters' intervention very 11 early on, that where the fire was occurring was from the 12 cooker forwards towards the window, and we could rule 13 out all of the other appliances that were in the rest of 14 the kitchen. 15 Q. I interrupted you, professor, apologies. I think you 16 were about to explain for us what you deduce from the 17 burn patterns in the south end of this kitchen. 18 A. In this particular photograph -- this was one of the 19 early photographs taken by the first fire investigation 20 team that went in which were from London Fire Brigade, 21 and their first task was to, quite rightly, take 22 a series of photographs that would simply document the 23 scene, so without moving things around too much or 24 damaging things too much, and that's exactly the right 25 approach to take.</p> <p style="text-align: right;">Page 31</p>
<p>1 patterns on the walls and on the appliances that we see 2 in the photograph. 3 The thermal imaging camera video in particular was 4 hugely helpful to be able to say that the fire in the 5 early stages damaged or was centred in only the area 6 from down at the fridge freezer and not the appliances 7 on the other side of the fridge freezer. 8 Q. That's the video we showed back in June? 9 A. That's correct. 10 Q. Yes. 11 A. The reason that I say that is because after the initial 12 fire was extinguished, the fire at some point re-entered 13 this flat, and at some point the appliances down this 14 end, from the cooker further down, were damaged to 15 a greater extent as a consequence of that re-entry. So 16 the burn patterns we're looking at and the damage to 17 these appliances are as a result of the initial fire, 18 plus a re-entry of that initial fire into the flat at 19 a later point. 20 So being able to sequence when this damage occurred 21 and what level of damage occurred to those appliances 22 from the cooker towards the door, taken from the thermal 23 imaging cameras, is incredibly important, because the 24 TIC showed that in actual fact there was very little, if 25 any, damage to the appliances from the cooker back to</p> <p style="text-align: right;">Page 30</p>	<p>1 So this was one of those early photographs. It's 2 taken from the living room, where the sliding doors 3 were, looking into the kitchen. What we're seeing -- so 4 I'm standing probably close to where some of the 5 television appliances and things like that were in the 6 living room, looking into the kitchen. 7 What you're seeing from the left-hand side, which is 8 the kitchen window side, over to the right-hand side, 9 which is where the doorway to the kitchen would be, 10 which is behind this pillar or further on from behind 11 that pillar, is a gradation, in my view, of the damage. 12 So it looks to be more damaged -- by the damage, I mean 13 it looks blacker, it looks more charred -- to the window 14 side than to the right-hand side of the kitchen. 15 So that's one aspect to view. 16 We can also see from this photograph that the 17 appliances towards the kitchen end[sic] -- so that's the 18 old freezer, the small fridge and the tall fridge 19 freezer -- are damaged to a greater degree than the 20 appliances starting with the cooker and moving back 21 towards the door end of the kitchen. 22 The other thing of note is that this room has not 23 gone through a process that we call flashover. 24 Flashover is indicated in terms of fire patterns or burn 25 patterns by burning from essentially the ceiling right</p> <p style="text-align: right;">Page 32</p>

<p>1 the way down to the floor. So everything that's</p> <p>2 combustible in the particular compartment will burn.</p> <p>3 We've got items that have survived -- for example,</p> <p>4 the bin -- items on the floor. Some of the kitchen</p> <p>5 cabinets and the doors of those cabinets are only burnt</p> <p>6 at the surface rather than burnt to a more penetrating</p> <p>7 degree.</p> <p>8 So those patterns initially are helpful in providing</p> <p>9 us with physical evidence to suggest that this end, the</p> <p>10 window end of the kitchen, was the one that was more</p> <p>11 badly damaged.</p> <p>12 Q. Thank you.</p> <p>13 The fifth and final source of evidence you've relied</p> <p>14 upon are stills from Mr Kebede's phone, or photos taken</p> <p>15 with Mr Kebede's phone, to be strictly accurate.</p> <p>16 Could I ask you to turn to page 38 of the report,</p> <p>17 and figure 23.</p> <p>18 First of all, could you explain for us what these</p> <p>19 images are, where they were taken from, what do you</p> <p>20 think they show?</p> <p>21 A. Yes, so these were images recovered from video that was</p> <p>22 taken on Mr Kebede's mobile telephone. The time stamp</p> <p>23 on the images was just after 01.05, and what the</p> <p>24 photographs show is from outside of Grenfell Tower,</p> <p>25 looking up towards the window of flat 16.</p> <p style="text-align: right;">Page 33</p>	<p>1 Again, could I just give a warning that some of</p> <p>2 these scenes show burnt-out debris.</p> <p>3 The first appliance I would be grateful for your</p> <p>4 help in relation to is the cooker.</p> <p>5 Ralph, if I could ask you to turn to page 60, and</p> <p>6 figure 54.</p> <p>7 A. Yes.</p> <p>8 Q. That shows the cooker. I think I can lead on that.</p> <p>9 If we turn back to page 59, Ralph, apologies, and</p> <p>10 paragraph 8.7.24 which is the bottom of page 59?</p> <p>11 A. Yes.</p> <p>12 Q. You say:</p> <p>13 "8.7.24. The electric cooker to the right-hand side</p> <p>14 of the tall fridge freezer was examined and found to</p> <p>15 have only superficial damage and melting to the plastic</p> <p>16 knobs of the appliance ..."</p> <p>17 Is it for that principal reason that you eliminated</p> <p>18 the cooker from consideration as having played any</p> <p>19 causative role?</p> <p>20 A. It's for that reason, but also from the video footage of</p> <p>21 the TIC.</p> <p>22 Q. Thank you.</p> <p>23 If we can go back to figure 57, which is page 69,</p> <p>24 Ralph, and if we could amplify figure 57.</p> <p>25 Looking in the far right-hand side, the microwave --</p> <p style="text-align: right;">Page 35</p>
<p>1 So in photograph (a), the red glow up at the top is</p> <p>2 the window of the kitchen of flat 16, and I understand</p> <p>3 the red glow to be the early stages of the developing</p> <p>4 fire within that flat.</p> <p>5 The white arrow is pointing at a line, which looks</p> <p>6 to be a sharp line, within that image, and that may be</p> <p>7 part of the window frame itself or it may be part of the</p> <p>8 appliance.</p> <p>9 In picture (b), which was taken at about -- the time</p> <p>10 stamp is the same, so it gives you an idea of how</p> <p>11 quickly things were developing, the white arrow in</p> <p>12 picture (b) is pointing at an area of flame that became</p> <p>13 visible in the video to the other side of the kitchen</p> <p>14 window, so that's the side away from or opposite the</p> <p>15 position of the fridge freezer.</p> <p>16 Q. Okay, thank you.</p> <p>17 Before we come to look at your conclusions on</p> <p>18 hypothesis 2, could we turn to examine the electrical</p> <p>19 appliances that you've eliminated as having played any</p> <p>20 causative role in more detail.</p> <p>21 You've adverted to the extent to which you've relied</p> <p>22 upon the video footage and excluding appliances from the</p> <p>23 cooker up to the microwave, but if we could go through</p> <p>24 the evidence in more detail in relation to those</p> <p>25 appliances.</p> <p style="text-align: right;">Page 34</p>	<p>1 the evidential basis for ruling out the microwave, would</p> <p>2 that be the video footage as well?</p> <p>3 A. Yes, pretty much for all of these appliances. So when</p> <p>4 you look at the photograph, they look to be badly</p> <p>5 damaged in some cases because some of them are</p> <p>6 collapsed, some of them are melted some of them are</p> <p>7 scorched, particularly the washing machine.</p> <p>8 However, as I've said, the fire re-entered into the</p> <p>9 kitchen at some point during the incident. The video</p> <p>10 footage from the thermal imaging camera, which was taken</p> <p>11 at the very first intervention of the firefighters into</p> <p>12 the kitchen, clearly showed that these appliances were</p> <p>13 not involved in the early stages of the fire.</p> <p>14 Q. Just following on from that answer, Ralph, if I could</p> <p>15 ask you to put down figure 57 and take us to page 81 of</p> <p>16 the report and paragraph 8.8.39.</p> <p>17 This is in relation to the microwave, professor.</p> <p>18 You say:</p> <p>19 "8.8.39. Mr Dan MATTHEWS ..."</p> <p>20 He was one of the investigators, I think.</p> <p>21 A. Yes, he was one of the investigators for Key Forensic</p> <p>22 Services.</p> <p>23 Q. "... also reports that the internal fuse within the</p> <p>24 microwave had operated ... and determined that this was</p> <p>25 most likely as a result of external fire attack and not</p> <p style="text-align: right;">Page 36</p>

<p>1 electrical activity. This was also the view expressed 2 in the Bureau Veritas fire and safety department report 3 dated the 7th November 2017 ..." 4 Is that a view with which you agree? 5 A. Yes. 6 Q. Could you give us a reason as to why? 7 A. Fuses within appliances in particular can operate -- 8 that means that they open or they blow, as some experts 9 have described it -- as a result of just simply heat or 10 experiencing heat from an external fire as opposed to 11 operating in their normal electrical safety function. 12 Q. Thank you. 13 Could I ask Ralph to put that down and return us to 14 page 69 and figure 57. 15 We see there at the right-hand side and in the 16 middle, identification of kettle and toaster 17 respectively. 18 Can you help us, on what basis did you eliminate 19 these two appliances as having any causative role? 20 A. Again, similar basis. They were clearly in view in the 21 TIC footage. They were also eliminated by Bureau 22 Veritas in their examination. 23 Q. Finally, you were in the hearing room yesterday to hear 24 Dr Glover's evidence. You've clearly read the report he 25 provided.</p> <p style="text-align: right;">Page 37</p>	<p>1 area of origin was the tall freezer, you say this, and 2 I quote: 3 "8.8.54. The combination of witness statements, TIC 4 footage, the fire patterns on the tall fridge freezer 5 and the laminate flooring underneath the tall fridge 6 freezer and the conclusions reached by Dr. Duncan GLOVER 7 in relation to his electrical examination all indicate 8 that it is more likely than not that the area of origin 9 of the fire was located at the southeast corner of the 10 kitchen in the tall fridge/freezer located along the 11 South facing wall." 12 First of all, does that remain your view? 13 A. Yes, it does. 14 Q. Thank you. 15 Again, as with the previous two hypotheses, I'd like 16 to go through the evidence you've relied upon in 17 reaching your conclusion. 18 Again, if I could repeat the general warning that 19 we'll be looking at photographs that show burnt debris 20 in the kitchen. 21 The first piece of evidence I'd like to turn to 22 relates to the old freezer and the small fridge that 23 was, I put it crudely, opposite the together fridge 24 freezer. 25 A. Yes.</p> <p style="text-align: right;">Page 39</p>
<p>1 A. Yes. 2 Q. Are you content or do you agree with his conclusions in 3 relation to the absence of causative evidence, if I can 4 put it that way, in relation to the appliances we've 5 just discussed? 6 A. Yes, I am. 7 Q. Your conclusion -- and if I could ask Ralph to take us 8 to page 68 and paragraph 8.8.16 -- in respect of 9 hypothesis 2 is this, and I quote: 10 "8.8.16. The evidence of the fire fighters and the 11 images from the thermal camera indicate that it is more 12 likely than not that the area of origin of the fire was 13 in the southeast area of the kitchen in flat 16." 14 Accepting that you've sought to reach your 15 conclusions on the balance of probabilities, first of 16 all, have you seen any evidence that suggests 17 an alternative to hypothesis 2? 18 A. No, I have not. 19 Q. Can we take it that you are reasonably confident in your 20 conclusion set out at 8.8.16? 21 A. Yes, I am confident of it. 22 Q. Professor, could I now turn to hypothesis 3. 23 Ralph, if I could ask you to take us to page 88, and 24 paragraph 8.8.54. 25 Professor, in relation to hypothesis 3, ie that the</p> <p style="text-align: right;">Page 38</p>	<p>1 Q. Could I ask Ralph to take us, first of all, to page 71 2 and figure 58. 3 We see there in figure 58, in the middle of that 4 page, in the bottom left-hand corner, what you described 5 as the "Assumed position of old freezer and small 6 fridge"; is that right? 7 A. Yes. 8 Q. Could you help us, what is the evidential basis for you 9 locating the old freezer and the small fridge there? 10 A. The positioning of them is based on the general plan 11 that Mr Kebede and other witnesses that lived in the 12 property presented of where the items in the kitchen 13 were, and also in the witness statements that were 14 presented by the initial firefighters, who said that 15 they stood on or leant on appliances or materials that 16 were there, which they later identified as the two 17 appliances we're talking about. Also, finally, the 18 photographs that were taken by the first fire 19 investigators when they documented the scene when they 20 did their scene examination on 14 June. 21 Q. Thank you, professor. 22 Ralph, if you could put that down and could we go to 23 page 72 and figure 59. 24 Can you help us, what does this photograph show, 25 first of all?</p> <p style="text-align: right;">Page 40</p>

<p>1 A. So this photograph -- I'll stand up and just talk you 2 through it. 3 Q. That would be useful, thank you. 4 A. This photograph is a photograph taken of the old 5 freezer. So if you imagine looking at this or slightly 6 to the left of this aspect here, you would expect to see 7 the window or the remains of the opening where the 8 window was in the kitchen. 9 This wooden beam here or piece of wood here is, 10 I believe, part of the partition or the sliding door 11 partition. 12 Q. Between the kitchen and living room? 13 A. Between the kitchen and the living room. I'm standing 14 in the living room in my position right now, and the 15 appliance that you're looking at is the old freezer that 16 was positioned under the kitchen window to the left-hand 17 side as you look down the kitchen. 18 Circled in red is, if you look at it carefully, the 19 remains of the appliance plug for this particular 20 appliance. 21 Q. That red circle is in the lower half of this photograph. 22 A. That's correct, and what is presumably the appliance 23 cord is trailing down to that plug. 24 Q. Thank you. 25 What do you deduce from the state of the plug?</p> <p style="text-align: center;">Page 41</p>	<p>1 Q. -- page 72. 2 A. Yes, apologies. 3 Q. Page 72, please, Ralph. 4 If we could amplify figure 59. Thanks, Ralph. 5 A. So this is, as we said, the old freezer here (Indicates) 6 if you look to the right-hand side of the photograph, 7 you just see the outline here (Indicates) of the small 8 fridge, so it just puts the two appliances in context 9 with each other. 10 Q. What you're identifying there, just for the transcript, 11 is in the far right-hand middle of the photograph, what 12 looks like a heavily rusty sheet of metal at an angle? 13 A. That's correct. 14 Q. Professor, thank you, that was useful. 15 Ralph, if we could go now to page 73 and figure 60. 16 Professor, what does this show us? 17 A. So this is a photograph taken at a slightly different 18 angle. So the previous photograph -- and I'm pointing 19 to the top left-hand corner of the photograph -- was 20 taken from that angle, where in the top left, this 21 object that looks slightly rusted is the old freezer. 22 This now is looking at it from the opposite side, if you 23 like, and the appliance that we're looking at in the 24 middle, this box-shaped thing, is the small fridge. 25 It's up against what is a door on the right-hand side,</p> <p style="text-align: center;">Page 43</p>
<p>1 A. It's difficult to say just simply from the photograph, 2 but the taking the evidence in the photograph, so 3 looking at it, and also the evidence presented by 4 Bureau Veritas in their report, the plug is not plugged 5 in, obviously, but it also appears to be quite badly 6 damaged by the effect of heat and possibly flame. It 7 shows that that appliance was not plugged in at the time 8 of the fire. 9 Q. What can we derive from the burn marks on the side of 10 the old freezer that's immediately in front of the 11 photograph? 12 A. It's difficult really to provide a strong interpretation 13 of that, other than the fridge freezer has clearly been 14 severely affected by fire. 15 Q. Do you agree with the conclusions that Dr Glover reached 16 in relation to the old freezer unit? 17 A. Yes. 18 Q. In relation to the small fridge, could I ask Ralph to 19 take us to figure 60, which is page 73. 20 Again, professor, starting with a basic question 21 first: what does this show us? 22 A. Again, it might be useful just to go back to the 23 previous photographs just for a moment. 24 Q. That would be -- 25 A. Just to orientate ourselves.</p> <p style="text-align: center;">Page 42</p>	<p>1 and that's the bottom door of the fridge freezer, the 2 tall fridge freezer. 3 To the very right of the photograph you see the 4 bottom of the cooker. So this appliance here is the 5 cooker. 6 Q. What is your assessment of whether the small fridge was 7 plugged in or not on the night of the fire? 8 A. My understanding is that it was not, but there's no 9 photographic evidence that I can see, as there was with 10 the old freezer, of plugs or any other sort of parts of 11 the appliance that are visible in these photographs. 12 But the witness statements and those of the fire 13 investigators who did see the appliance in situ have 14 said it was not plugged in. 15 Q. Just for the sake of completeness, if I could ask you 16 first of all to confirm, are you content with 17 Dr Glover's conclusions in relation to the small fridge? 18 A. Yes, I am. 19 Q. Could I ask you now to turn to page 74 and 20 paragraph 8.8.24. It just fleshes out the answer you've 21 just given as to another aspect of evidence as to 22 whether the small fridge was plugged in or not. 23 A. Yes, that's correct. This was taken from a discussion 24 or interview between Watch Manager Leaver and Mr Kebede. 25 Q. Just for the record, 8.8.24 reads thus:</p> <p style="text-align: center;">Page 44</p>

<p>1 "8.8.24. The witness statement of Mr Behailu KEBEDE 2 ... and contemporaneous notes of Fire Fighter Daniel 3 BROWN ... also suggested that the initial fire was not 4 in the old freezer and small fridge. Mr Behailu KEBEDE 5 when being interviewed by Watch Manager Matthew LEAVER 6 [A71] said 7 "LEAVER: And these two [referring to the old 8 freezer and small fridge] definitely not plugged in?" 9 "KEBEDE: Definitely, these not working". 10 "Fire Fighter Daniel BROWN ... said that; 11 "CM Batterbee pointed out that it was a fridge that 12 he put out. This was towards the right-hand side of the 13 back wall." 14 That's the evidence you relied upon in your 15 conclusions. 16 A. Yes. 17 Q. Could I now ask you to turn to paragraph 8.8.25, same 18 page. 19 Just to confirm, for the avoidance of doubt, you 20 conclude here in relation to the old freezer and small 21 fridge: 22 "8.8.25. On the basis of this evidence, it is 23 unlikely that the old freezer and small fridge are in 24 the area of origin of the fire although these appliances 25 were clearly involved in the fire at some later point.</p> <p style="text-align: center;">Page 45</p>	<p>1 SIR MARTIN MOORE-BICK: Thank you very much. 2 Right, 11.10, then, please. 3 (11.00 am) 4 (A short break) 5 (11.10 am) 6 SIR MARTIN MOORE-BICK: All right, professor? Ready to 7 carry on? 8 THE WITNESS: Yes, thank you. 9 SIR MARTIN MOORE-BICK: Yes, Mr Kinnier. 10 MR KINNIER: Thank you, sir. 11 Professor, thank you very much for coming back. 12 We were dealing with hypothesis 3 and we were 13 dealing with electrical appliances found within the 14 narrowed-down area of origin that you set out in your 15 report. 16 A. Yes. 17 Q. The second appliance I'd like to discuss with you is the 18 hot plate electric cooking device that has been 19 variously described as an "m'tad" or "injera" pan. 20 A. Yes. 21 Q. If I could ask Ralph to put up figure 63 on page 75. If 22 you could amplify figure 63. 23 First of all, is that the appliance that has been 24 variously described as I've just set out? 25 A. Yes, that's my understanding.</p> <p style="text-align: center;">Page 47</p>
<p>1 This allows the area of origin of the fire to be 2 narrowed to the southeast corner of the kitchen as 3 indicated by the red line in figure 62." 4 If we could de-amplify that paragraph and amplify 5 figure 62, which is immediately below. 6 The red line to which you refer, is that marked in 7 the far left-hand side? 8 A. Yes, that's correct. 9 Q. Thank you. 10 Final question in this respect: do you remain of the 11 view set out in paragraph 8.8.25 in relation to the old 12 freezer and small fridge? 13 A. Yes, I do. 14 MR KINNIER: Thank you. 15 Sir, that is a convenient point at which to invite 16 you to rise for a small break. 17 SIR MARTIN MOORE-BICK: Well, professor, we normally have 18 a short break about an hour into the session, so we'll 19 take one now and we'll resume at 11.10. 20 I have to ask you, please, not to talk about your 21 evidence to anyone while you're out of the room. 22 THE WITNESS: Of course. 23 SIR MARTIN MOORE-BICK: If you go with the usher, she'll 24 look after you. 25 THE WITNESS: Thank you very much.</p> <p style="text-align: center;">Page 46</p>	<p>1 Q. Are you content that, irrespective of where this pan may 2 have been stored before the fire, there is no evidence 3 to suggest that it was plugged in on the night of the 4 fire? 5 A. That's correct. 6 Q. Are you content with Dr Glover's assessment that the 7 items showed no signs of electrical activity? 8 A. Yes. 9 Q. Or arcing, to be pertinent. 10 A. Yes. 11 Q. Therefore, can this device be ruled out as having played 12 any causative role in the initial fire? 13 A. In my opinion, yes. 14 Q. Thank you. 15 The third appliance or device I'd like to cover is 16 the kitchen contractor fan. 17 Ralph, may I ask you to turn to page 28 and 18 figure 15. 19 First of all, professor, what does this photo show? 20 A. This was a photograph that was taken of flat 13, which 21 was used, as I understand it, as an exemplar flat to 22 look at the orientation of various parts of the kitchen, 23 particularly the area around the window. 24 It's my understanding that this photograph was used 25 and has been used as an exemplar to show what the</p> <p style="text-align: center;">Page 48</p>

<p>1 kitchen window set-up, if you like, was like in flat 16.</p> <p>2 So you have the large windowpane or large window to</p> <p>3 the left-hand side of the photograph, the small</p> <p>4 windowpane to the right-hand side, and above that there</p> <p>5 was an infill panel which housed the extractor fan.</p> <p>6 Q. If we could de-amplify that, please, Ralph, and just for</p> <p>7 the sake of completeness go to paragraph 8.4.5, which is</p> <p>8 at page 27.</p> <p>9 This is just to confirm the evidence you've given</p> <p>10 that effectively the photograph shows a comparable flat.</p> <p>11 A. Yes.</p> <p>12 Q. Ralph, if you could take that down and could you take us</p> <p>13 to page 80 and, in particular, paragraph 8.8.35.</p> <p>14 Here you are discussing the various examinations</p> <p>15 that were carried out in relation to the gridded areas</p> <p>16 within the kitchen, which we've covered before in June.</p> <p>17 You say at 8.8.35:</p> <p>18 "8.8.35. These examinations appeared to involve</p> <p>19 removal of the various items from the bags in which they</p> <p>20 were contained followed by a non-destructive visual</p> <p>21 examination. In some cases, a microscope (unspecified</p> <p>22 in terms of type) was also used and in some cases X-ray</p> <p>23 examination of fuses was undertaken ..."</p> <p>24 A. Yes.</p> <p>25 Q. For the uninitiated in the room, what can you derive</p> <p style="text-align: center;">Page 49</p>	<p>1 Looking at screenshot (a) on the left-hand side,</p> <p>2 first of all, what does the white arrow specifically</p> <p>3 indicate?</p> <p>4 A. What I was indicating with this white arrow was the</p> <p>5 black line. So the line of flame looks to be running up</p> <p>6 against a black line. This may very well be part of the</p> <p>7 construction of the window, or it may be something that</p> <p>8 relates to the positioning of the flame within the</p> <p>9 kitchen. So against the appliance, the tall fridge</p> <p>10 freezer, for example.</p> <p>11 It very much depends on the angle at which the</p> <p>12 photograph was taken, but that's what the white line is</p> <p>13 indicating.</p> <p>14 Q. Looking at (b), you've explained to us what the arrow on</p> <p>15 the far right-hand side indicates.</p> <p>16 What, if anything, can you deduce from the orange</p> <p>17 colour in the middle of the photograph in relation to</p> <p>18 the kitchen extractor fan?</p> <p>19 A. Nothing really from this photograph.</p> <p>20 Q. Could I ask you to take that down, Ralph, and go back to</p> <p>21 page 39, looking at figure 25.</p> <p>22 Again, I acknowledge we've gone through these</p> <p>23 earlier, but I want to look at it in the particular</p> <p>24 context of the kitchen extractor fan.</p> <p>25 Starting on the far left-hand side, does (a) teach</p> <p style="text-align: center;">Page 51</p>
<p>1 from non-destructive visual examination generally, and</p> <p>2 then we'll look at the extractor fan debris?</p> <p>3 A. Okay, non-destructive visual examination is exactly as</p> <p>4 it sounds. So it involves looking at the various</p> <p>5 components -- so they might be small conductors, they</p> <p>6 might be the larger appliance -- by eye, initially.</p> <p>7 They might involve some cleaning of the items so that</p> <p>8 they can be visualised or looked at in more detail, and</p> <p>9 they might involve looking at some of the components</p> <p>10 under a microscope or with specialist equipment such as</p> <p>11 X-rays, micro-CT scanners, scanning electron microscopes</p> <p>12 and so on. All of that is non-destructive in terms of</p> <p>13 the examination of the particular item.</p> <p>14 Q. Just to bottom off this point, do you agree with the</p> <p>15 analysis that Dr Glover set out in relation to the</p> <p>16 extractor fan and that it effectively played no</p> <p>17 causative role in the initial fire?</p> <p>18 A. Yes, I do.</p> <p>19 Q. Thank you.</p> <p>20 Just to flesh out the evidence in relation to the</p> <p>21 extractor fan, could I ask Ralph to take us to page 38</p> <p>22 and figure 23.</p> <p>23 We looked at this earlier, but I think it may be</p> <p>24 helpful just to go back, looking at the particular</p> <p>25 context of the kitchen contractor fan.</p> <p style="text-align: center;">Page 50</p>	<p>1 us anything, or can we deduce anything, rather, about</p> <p>2 the causative role of the kitchen extractor fan simply</p> <p>3 from this photo?</p> <p>4 A. Not in terms of a causative role. What the photograph</p> <p>5 shows in a sequence is the flames starting or appearing</p> <p>6 to begin to burn around the extractor fan where the</p> <p>7 infill panel was. It might be useful to look at the</p> <p>8 photographs in figure 24 as well --</p> <p>9 Q. Yes, please.</p> <p>10 A. -- just to put all of them together on the one screen,</p> <p>11 so 24 and 25.</p> <p>12 Q. Yes.</p> <p>13 A. So if I --</p> <p>14 Q. Sorry, you are on your feet quite a lot during the</p> <p>15 course of this.</p> <p>16 A. So if I'm looking at the very first photograph of</p> <p>17 figure 24, so the one to the far left, you can begin to</p> <p>18 see -- and looking at these in sequence, simply</p> <p>19 following one from the other, both in 24 and then in</p> <p>20 25 -- the flames developing around in a circular</p> <p>21 pattern, around where this infill was, and those</p> <p>22 I believe to be the flames burning around where the</p> <p>23 metal extractor fan would be.</p> <p>24 Q. Thank you.</p> <p>25 The next matter in relation to materials within what</p> <p style="text-align: center;">Page 52</p>

<p>1 you've identified as the hypothetical area of origin is</p> <p>2 the presence of any other combustible materials in the</p> <p>3 south-east end of the kitchen.</p> <p>4 We don't need to go to it, but in your preliminary</p> <p>5 report you noted there may have been presence of</p> <p>6 combustible material in the south end of the kitchen.</p> <p>7 On the basis of the available evidence, is there</p> <p>8 anything to suggest the presence of any other</p> <p>9 combustible materials that may have ignited a fire in</p> <p>10 the south-east end of the kitchen?</p> <p>11 A. Not that may have ignited a fire. There was evidence</p> <p>12 presented by the witnesses who lived in the flat to say</p> <p>13 that there was a mop and a bucket that was usually</p> <p>14 stored in that area, and they may have contributed</p> <p>15 because they may have been combustible. So they may</p> <p>16 have contributed to the fire.</p> <p>17 Q. Is the position we've reached, therefore, that with the</p> <p>18 exception of the tall fridge freezer, all other</p> <p>19 alternative appliances have been excluded as having any</p> <p>20 causative role in the area of origin you've identified</p> <p>21 in the report?</p> <p>22 A. Yes.</p> <p>23 Q. Can we turn to the tall fridge freezer now, and could</p> <p>24 I ask you to turn to page 88 in your report and</p> <p>25 paragraph 8.8.54.</p> <p style="text-align: right;">Page 53</p>	<p>1 amplify 8.8.24 on the same page.</p> <p>2 Just for the sake of completeness, we've looked at</p> <p>3 this before in the context of the old freezer and the</p> <p>4 small fridge, but equally that evidence as well?</p> <p>5 A. Yes.</p> <p>6 Q. Ralph, if you could de-amplify that and amplify</p> <p>7 paragraph 8.8.24 on page 74.</p> <p>8 Apologies, it's really to draw out, in particular,</p> <p>9 Firefighter Brown's evidence at the bottom of that</p> <p>10 paragraph. You relied upon that as well?</p> <p>11 A. Yes.</p> <p>12 Q. There you've taken the fridge that he put out to be the</p> <p>13 tall fridge freezer?</p> <p>14 A. Correct, yes.</p> <p>15 Q. Is there any further evidence that you have seen which</p> <p>16 would be relevant to this aspect of your consideration</p> <p>17 of the evidence as to whether the tall fridge freezer</p> <p>18 was plugged in and turned on?</p> <p>19 A. By this you mean with the witnesses --</p> <p>20 Q. Factual witness statement.</p> <p>21 A. No, this covers it.</p> <p>22 Q. The next source of evidence is the thermal images, and</p> <p>23 if we could turn to page 32 of your report and</p> <p>24 figure 19, again.</p> <p>25 In the particular context of the tall fridge</p> <p style="text-align: right;">Page 55</p>
<p>1 There you say, and I quote:</p> <p>2 "8.8.54. The combination of witness statements, TIC</p> <p>3 footage, the fire patterns on the tall fridge freezer</p> <p>4 and the laminate flooring underneath the tall fridge</p> <p>5 freezer and the conclusions reached by Dr. Duncan GLOVER</p> <p>6 in relation to his electrical examination all indicate</p> <p>7 that it is more likely than not that the area of origin</p> <p>8 of the fire was located at the southeast corner of the</p> <p>9 kitchen in the tall fridge/freezer located along the</p> <p>10 South facing wall."</p> <p>11 Does that remain your view?</p> <p>12 A. Yes, it does.</p> <p>13 Q. Again, as with the previous hypotheses, if I may take us</p> <p>14 through the various sources of evidence you've relied</p> <p>15 upon in reaching your view.</p> <p>16 The first source of evidence you've relied upon</p> <p>17 would be the evidence of Mr Kebede; is that right?</p> <p>18 A. Yes.</p> <p>19 Q. If I could ask Ralph to take us to page 72, and</p> <p>20 paragraph 8.8.23.</p> <p>21 Correct me if I'm wrong, but is that the evidence</p> <p>22 you've relied upon for concluding that it was only the</p> <p>23 tall fridge freezer that was plugged in and turned on?</p> <p>24 A. Yes, that's correct.</p> <p>25 Q. If I could ask Ralph to de-amplify that paragraph and to</p> <p style="text-align: right;">Page 54</p>	<p>1 freezer, to what extent have you relied upon this</p> <p>2 imaging in identifying the tall fridge freezer as the</p> <p>3 area of origin, if at all?</p> <p>4 A. This was more difficult, really because the thermal</p> <p>5 imaging camera is showing areas within the kitchen</p> <p>6 towards the window end where there was a greater</p> <p>7 intensity of heat.</p> <p>8 So in my interpretation of these images, it points</p> <p>9 out that these areas of greater heat were around the</p> <p>10 tall fridge freezer as opposed to being within the tall</p> <p>11 fridge freezer.</p> <p>12 Q. Can I ask Ralph to take us to page 37 of the report and</p> <p>13 figure 22.</p> <p>14 First of all, what does this show?</p> <p>15 A. This is a still from the thermal imaging camera just</p> <p>16 after the firefighters have extinguished the majority of</p> <p>17 the fire in the tall fridge freezer.</p> <p>18 What it depicts -- I'll stand up again -- if we look</p> <p>19 from the right-hand side across to the left-hand side,</p> <p>20 is the part of the cooker -- you can just see the cooker</p> <p>21 knobs, just around here (Indicates).</p> <p>22 Q. They're the faint ones in the bottom right-hand corner.</p> <p>23 A. Yes, that's correct.</p> <p>24 Then you can begin to see along here (Indicates),</p> <p>25 which is about midway in the photograph, a grey line</p> <p style="text-align: right;">Page 56</p>

<p>1 that comes out from the back of the photograph towards</p> <p>2 the front. That's the open door of the bottom</p> <p>3 compartment of the tall fridge freezer.</p> <p>4 The area where the little green box is centred is</p> <p>5 the bottom compartment of the tall fridge freezer.</p> <p>6 The area immediately above that, where the blue</p> <p>7 cross is, is the top compartment of the tall fridge</p> <p>8 freezer.</p> <p>9 As you move over towards the left of the photograph,</p> <p>10 and along almost perpendicular to the open door of the</p> <p>11 bottom compartment is another grey defined area which</p> <p>12 I believe to be the door of the top of the tall fridge</p> <p>13 freezer.</p> <p>14 Then further on, where my arrow points at and says</p> <p>15 "Items between tall fridge freezer and window", which</p> <p>16 are now believed to be the mop and the bucket, are</p> <p>17 highlighting some items we can just about make out.</p> <p>18 Then over further, where the number "129C" is, you</p> <p>19 can just see behind that a silhouette of the</p> <p>20 firefighter.</p> <p>21 Q. When looking at area of origin, to what extent does this</p> <p>22 thermal image assist you?</p> <p>23 A. It provides assistance in that it shows some of the</p> <p>24 early damage to the appliance, which is the tall fridge</p> <p>25 freezer. It shows that there wasn't damage to the</p> <p style="text-align: center;">Page 57</p>	<p>1 discolouration on the wall, which indicates that there</p> <p>2 was flame impinging or up against that wall.</p> <p>3 Then as we move over to the item on the right-hand</p> <p>4 side, this is the tall fridge freezer, where you can see</p> <p>5 significant fire damage within the top compartment of</p> <p>6 the fridge freezer.</p> <p>7 Q. Ralph, if you could de-amplify that photograph, and</p> <p>8 you'll see at the bottom of page 76, there's a second</p> <p>9 figure 64. If we could amplify that.</p> <p>10 Professor, again, if we can look at the photograph</p> <p>11 on the left-hand side, the burn corrosion patterns on</p> <p>12 the wall, what can you deduce from them?</p> <p>13 A. The patterns that we're looking at, these patterns here,</p> <p>14 which are in between the fridge freezer and the side of</p> <p>15 the window, which is here on the left, you're looking at</p> <p>16 a number of things. The patterns on the wall are all</p> <p>17 the way down to the ground, and these patterns are most</p> <p>18 likely caused by flame impinging, so flame up against</p> <p>19 the wall from the top to the bottom, or potentially from</p> <p>20 the top to the bottom.</p> <p>21 What you also see is that the laminate flooring in</p> <p>22 between where the fridge freezer is, and where the side</p> <p>23 of the bottom underneath the window is, is clean, so</p> <p>24 it's not damaged by fire directly, and next to that you</p> <p>25 have the tall fridge freezer appliance.</p> <p style="text-align: center;">Page 59</p>
<p>1 cooker, and it shows that the damage to the tall fridge</p> <p>2 freezer was significant in that the door of the top</p> <p>3 compartment had come away and the bottom door had</p> <p>4 opened.</p> <p>5 Q. In relation to establishing cause, which we'll come on</p> <p>6 to later on, to what extent, if at all, does this image</p> <p>7 help?</p> <p>8 A. It doesn't help me at all.</p> <p>9 Q. Thank you.</p> <p>10 The next source of evidence I'd like to go through</p> <p>11 is the corrosion and the burn patterns on the fridge</p> <p>12 freezer itself.</p> <p>13 Might I ask Ralph to take us to page 76 to start off</p> <p>14 with. Thank you very much.</p> <p>15 Looking at figure 64 in particular -- and if that</p> <p>16 could be amplified for these purposes, thank you, Ralph.</p> <p>17 Again, professor, first of all, what does this photo</p> <p>18 show us?</p> <p>19 A. What this photograph is showing is -- so we're looking</p> <p>20 down into the corner where the tall fridge freezer was,</p> <p>21 or is. Along the left-hand side, this is the edge of</p> <p>22 the window. You can see some debris that's sitting on</p> <p>23 top of the windowsill. As we move closer and over</p> <p>24 towards the right-hand side, you can see a pattern on</p> <p>25 the wall, which is this sort of multicolour or</p> <p style="text-align: center;">Page 58</p>	<p>1 Q. Looking at the right-hand side of the photograph, you</p> <p>2 have letters A and B marked on the side of the tall</p> <p>3 fridge freezer.</p> <p>4 A. Yes.</p> <p>5 Q. But before we get to that, there appears to be a red</p> <p>6 bag. Can you help us, first of all, with what that red</p> <p>7 bag is?</p> <p>8 A. My understanding of what the red bag is, is that it is</p> <p>9 a red plastic bag that was put onto a set of cables or</p> <p>10 conductors that were behind the tall fridge freezer, and</p> <p>11 that that bag was attached to those conductors by the</p> <p>12 fire investigators in order to try to protect the</p> <p>13 conductors from damage, would be my understanding of</p> <p>14 what they were doing.</p> <p>15 Q. Thank you.</p> <p>16 What does capital letter A denote?</p> <p>17 A. Capital letter A -- perhaps we'll take both of them</p> <p>18 together, if you don't mind -- capital letter A and</p> <p>19 capital letter B both depict two different fire</p> <p>20 patterns.</p> <p>21 Q. What do you deduce from the fire patterns?</p> <p>22 A. So for the fire pattern depicted by the letter A, you</p> <p>23 can follow it by looking at the two photographs in</p> <p>24 comparison with each other. This shows a discolouration</p> <p>25 on the side of the tall fridge freezer that runs from</p> <p style="text-align: center;">Page 60</p>

<p>1 the bottom of the appliance right the way up to the top.</p> <p>2 So it's spread out and it's depicted by the red line</p> <p>3 that I've drawn. It's spread out and runs up the whole</p> <p>4 length of the appliance.</p> <p>5 Pattern B is another pattern that runs across the</p> <p>6 side of the appliance and across, in part, the front</p> <p>7 door of it, which we'll see, I presume, a little bit</p> <p>8 later.</p> <p>9 What pattern A suggests to me is that the tall</p> <p>10 fridge freezer on this side -- there's a mirroring</p> <p>11 pattern on the other side of the appliance -- is that</p> <p>12 the appliance was affected by fire from the bottom to</p> <p>13 the top.</p> <p>14 What you're seeing is a delamination or a burning</p> <p>15 off of the paint from the metal, and that's caused</p> <p>16 a discolouration, and that would've occurred because of</p> <p>17 direct flame attack on the appliance.</p> <p>18 Q. If you stay on your feet -- I apologise again -- if we</p> <p>19 can look at that mirror image on the other side. Can we</p> <p>20 turn to figure 65 on page 77.</p> <p>21 First of all, can you confirm this is the mirror</p> <p>22 image to which you were referring in your answer?</p> <p>23 A. Yes. What you're looking at here is the fridge freezer</p> <p>24 has been moved away from the wall that it was up</p> <p>25 against, so it's been moved about some distance away,</p> <p style="text-align: right;">Page 61</p>	<p>1 repositioned the door of the top compartment of the</p> <p>2 fridge freezer back into what they perceive or believe</p> <p>3 to be its original position, or how it would've been</p> <p>4 viewed.</p> <p>5 If you recall, this door fell off the appliance at</p> <p>6 some point and was found by the fire investigators lying</p> <p>7 on the floor, propped beside the bottom door, which was</p> <p>8 open.</p> <p>9 The pattern that you're looking at is depicted with</p> <p>10 the red line, and, again, what you have seen or what</p> <p>11 we're seeing is a burning off of the paint on the</p> <p>12 surface of the top door, allowing the door to be</p> <p>13 corroded.</p> <p>14 The pattern appears to move from the left-hand side</p> <p>15 to the right. By that I mean it's further down on the</p> <p>16 left-hand side than it is on the right-hand side. That</p> <p>17 could be simply a consequence of the dynamic nature of</p> <p>18 the fire, or it could also be a consequence of the</p> <p>19 movement of gases because there was a window, therefore</p> <p>20 a ventilation opening, to the left-hand side of that</p> <p>21 appliance.</p> <p>22 Q. Understood. That would --</p> <p>23 SIR MARTIN MOORE-BICK: Can I just ask, is the pattern we</p> <p>24 see in this photograph, on what is the front of the</p> <p>25 door, a continuation of pattern B on the side?</p> <p style="text-align: right;">Page 63</p>
<p>1 and we're looking now at -- if I was standing looking at</p> <p>2 the fridge freezer in front of me, we're now looking at</p> <p>3 the right-hand side of it.</p> <p>4 Q. Thank you, professor. If we look at the right-hand</p> <p>5 photograph, again, we have burn patterns indicated A and</p> <p>6 B; is that right?</p> <p>7 A. Yes.</p> <p>8 Q. What do you deduce, first of all, from fire pattern A?</p> <p>9 A. Same as the previous one, it's a continuation, if you</p> <p>10 like, of the other pattern, so they both would've</p> <p>11 occurred more or less at the same time on each side of</p> <p>12 the appliance. So it shows a fire attack from the</p> <p>13 bottom to the top of that appliance.</p> <p>14 Q. Again, B is the mirror image of B in figure 64?</p> <p>15 A. That's correct.</p> <p>16 Q. Thank you.</p> <p>17 Could I now ask you to turn to page 78 and</p> <p>18 figure 66, just while we're looking at burn patterns on</p> <p>19 the fridge itself.</p> <p>20 Professor, apologies again, summon you to your feet.</p> <p>21 Looking at the far left-hand corner, what can we</p> <p>22 deduce, if anything -- or, indeed, the right-hand corner</p> <p>23 photo -- from the nature and extent of the fire patterns</p> <p>24 identified in the red line on the right-hand side?</p> <p>25 A. What's happened here is that the fire investigators have</p> <p style="text-align: right;">Page 62</p>	<p>1 A. In part. It's a continuation of the pattern, and it's</p> <p>2 difficult to ascertain that because, of course, we can't</p> <p>3 see it in three dimensions, but it appears to be</p> <p>4 a continuation of the patterns on both sides.</p> <p>5 So if you look at the photograph quite carefully,</p> <p>6 where the red line -- where the door is breached on the</p> <p>7 right-hand side, you can just about see the right-hand</p> <p>8 side of the fridge freezer, and you can see that that</p> <p>9 corrosion line is almost in line across the door and the</p> <p>10 right-hand side.</p> <p>11 SIR MARTIN MOORE-BICK: Yes.</p> <p>12 MR KINNIER: Professor, thank you. Again, if I could ask</p> <p>13 you to stay on your feet -- sorry about this -- and ask</p> <p>14 Ralph to turn to page 79.</p> <p>15 Ralph, if we're able to split screen figures 67 and</p> <p>16 68 so they are alongside each other.</p> <p>17 Professor, if we can look at figure 67, first of</p> <p>18 all.</p> <p>19 A. Yes.</p> <p>20 Q. First of all, what does it show, and secondly, what is</p> <p>21 your interpretation?</p> <p>22 A. We're now looking at the laminate floor that was in the</p> <p>23 area of the kitchen where the fridge freezer originally</p> <p>24 stood. So if I look at it from the right-hand side</p> <p>25 across to the left, what the fire investigators have</p> <p style="text-align: right;">Page 64</p>

<p>1 done is they have cleared away all of the appliances and</p> <p>2 they have cleared away most of the debris from this</p> <p>3 area. So they've cleared away all of the surface fire</p> <p>4 debris and bits of loose materials.</p> <p>5 What they've observed as they've done that across</p> <p>6 this laminate floor is that there is an area,</p> <p>7 highlighted by the red mark, that illustrates an area</p> <p>8 where the laminate floor has been burnt through. That's</p> <p>9 significant because the areas on either side of it have</p> <p>10 not been burnt through. This area corresponds with the</p> <p>11 positioning of the fridge freezer.</p> <p>12 The white lines, the white arrows, illustrate</p> <p>13 an area at the back almost matching exactly the</p> <p>14 positioning of this burn mark in the laminate. That</p> <p>15 shows that the skirting board has also burnt down to</p> <p>16 a low point in comparison to the skirting board on both</p> <p>17 sides. That's also significant because it provides</p> <p>18 physical evidence that a fire burnt there to a greater</p> <p>19 extent than it did to the areas on either side of that</p> <p>20 burn mark.</p> <p>21 SIR MARTIN MOORE-BICK: Can we see the remains of the</p> <p>22 skirting board at all?</p> <p>23 A. You can just about. If you look very carefully, it</p> <p>24 looks a little bit more burnt towards the right-hand</p> <p>25 side of the mark, as you can see on the furthestmost</p> <p style="text-align: right;">Page 65</p>	<p>1 Again, just for the sake of completeness, professor,</p> <p>2 can you identify what this is for us?</p> <p>3 A. Yes, these are the portions of the laminate flooring</p> <p>4 taken from immediately under the tall fridge freezer and</p> <p>5 slightly to both sides that were recovered by the fire</p> <p>6 investigators from flat 16.</p> <p>7 Q. Tying together the evidence you've given in relation to</p> <p>8 the floor burn patterns, and the burn patterns that you</p> <p>9 identified on the large fridge freezer itself, are you</p> <p>10 able to give us a conclusion as to where within the</p> <p>11 large fridge freezer the initial fire may have been, in</p> <p>12 your view?</p> <p>13 A. Looking at these burn patterns in particular, the burn</p> <p>14 pattern to the skirting board and also the damage to the</p> <p>15 sides in particular of the outside of the tall fridge</p> <p>16 freezer, where the damage runs from the bottom to the</p> <p>17 top, it would be my view that the fire was originally</p> <p>18 orientated in the base of the fridge freezer.</p> <p>19 Q. Thank you.</p> <p>20 Professor, could I ask you now to turn to page 83 of</p> <p>21 your report, and paragraph 8.845.</p> <p>22 Professor, here you say and I quote -- we are now</p> <p>23 looking away from the large fridge freezer itself but</p> <p>24 looking at the fuse box, or what was called the consumer</p> <p>25 unit yesterday.</p> <p style="text-align: right;">Page 67</p>
<p>1 right arrow, and there are some remains, from what my</p> <p>2 interpretation of the photograph is, of parts of the</p> <p>3 skirting board.</p> <p>4 MR KINNIER: Ralph, are you able to magnify figure 67</p> <p>5 sufficiently so that Professor Nic Daeid can identify</p> <p>6 the extent of the damage on the right? That's</p> <p>7 brilliant, thank you.</p> <p>8 A. Yes, so you can see along here (Indicates) -- and I'm</p> <p>9 pointing at this kind of jaggedly charred edge -- that</p> <p>10 that shows some of the wood of the skirting board</p> <p>11 remaining.</p> <p>12 Q. Professor, simply for the assistance of the transcriber,</p> <p>13 if we're looking at the right-hand end of the red mark</p> <p>14 which identifies the burnt laminate flooring, at the top</p> <p>15 of that is the skirting board; is that right?</p> <p>16 A. Yes.</p> <p>17 Q. As we look across the left-hand side, you've identified</p> <p>18 the far right-hand side as being the greatest extent of</p> <p>19 damage to the skirting board.</p> <p>20 A. Yes.</p> <p>21 Q. Which diminishes as you go along towards the window.</p> <p>22 A. It doesn't diminish completely; it goes up and down.</p> <p>23 But, yes.</p> <p>24 Q. Okay, thank you.</p> <p>25 Ralph, if you could magnify figure 68.</p> <p style="text-align: right;">Page 66</p>	<p>1 A. Yes.</p> <p>2 Q. You identify here the operation of the MCB.</p> <p>3 First of all, when you refer to the MCB, it is in</p> <p>4 fact what we were calling yesterday the circuit breaker;</p> <p>5 is that right?</p> <p>6 A. It stands for miniature circuit breaker, yes.</p> <p>7 Q. Just so it can be read into the record, you say here,</p> <p>8 and I quote:</p> <p>9 "8.8.45. The operation of the MCB would have</p> <p>10 occurred before the main electrical supply to flat 16</p> <p>11 was deactivated. If Mr Behailu KEBEDE's recollection is</p> <p>12 correct, then he operated the main switch in the fuse</p> <p>13 box as he exited flat 16. This is important because it</p> <p>14 means that if electrical activity as a result of fire</p> <p>15 attack or appliance failure was found within flat 16,</p> <p>16 then it would have occurred within the early stages of</p> <p>17 the developing fire when the kitchen circuit (circuit 7)</p> <p>18 and appliances were still energised. This means that</p> <p>19 evidence of electrical activity such as arc melting</p> <p>20 could provide specific physical evidence linked to the</p> <p>21 earliest stages of the fire's development which would</p> <p>22 assist in narrowing the area of fire origin as defined</p> <p>23 by the electrical system."</p> <p>24 First things first, does that remain your view?</p> <p>25 A. Yes, it does.</p> <p style="text-align: right;">Page 68</p>

<p>1 Q. For the avoidance of doubt, is it your understanding 2 that the large fridge freezer was served by circuit 7? 3 A. That's my understanding, yes. 4 Q. Ralph, if you could de-amplify that paragraph, and if 5 you could amplify figure 70, and first of all (a). 6 When you were referring to Mr Kebede's evidence in 7 terms of switching off the main switch, there it is 8 identified in the down position, indicating off. 9 A. Yes. 10 Q. If that could be de-amplified, Ralph, and if you could 11 amplify (b). 12 Really, as we were discussing yesterday, next but 13 one from the right-hand side circuit breaker is 14 circuit 7, which is in the off position. 15 A. Yes, correct. 16 Q. Can I now ask you to turn to paragraph 8.8.49. That's 17 at page 85. There you summarise the conclusions in 18 Dr Glover's report. 19 My question is: do you agree with the conclusions he 20 reached in that report in respect of arc damage? 21 A. In relation to his identification of arc damage on 22 MJS/1, and JDG/1, yes. 23 Q. Thank you. 24 Turning further down to 8.8.50, you say this, and 25 I quote:</p> <p style="text-align: center;">Page 69</p>	<p>1 trip'." 2 Does that remain your view? 3 A. Yes, it does. 4 Q. You were in the hearing yesterday. 5 A. Yes. 6 Q. Is there anything in relation to the examination of 7 circuit number 7 that you would wish to add to what 8 Dr Glover said yesterday? 9 A. In terms of the examination of circuit 7, I agree that 10 the miniature circuit breaker tripped out or operated as 11 a result of a short circuit that occurred in 12 an appliance that was attached to that circuit. 13 I'm not in full agreement with some of the other 14 electrical evidence that Dr Glover gave, but I'm not 15 an electrical expert. 16 Q. Okay. If we can just deal with the bits -- figure 71, 17 first of all, at page 86. 18 Can you first of all explain for us what this is? 19 A. This is a diagram of the corner of the kitchen of 20 flat 16. We've seen the diagram already. What I have 21 done on this particular diagram is annotate where the 22 various items were that were examined by Dr Glover which 23 were shown to have evidence of electrical activity in 24 the report and the memo that I was provided with. 25 What I've attempted to do is show in this figure</p> <p style="text-align: center;">Page 71</p>
<p>1 "8.8.50. Dr. Duncan GLOVER reported that he 2 observed evidence of alloying damage, that is melting of 3 copper in the presence of another metal which acts to 4 reduce the temperature at which the copper-metal mixture 5 melts, on exhibits MJS/2 and JDG/2 both of which were 6 recovered from BPS3 which was the wiring recovered from 7 the base of the tall fridge freezer ... Electrical fire 8 experts from Exponent also observed evidence of 9 'electrical activity on wiring consistent with fire 10 involvement while energised as either a cause or a 11 result of the fire'. 12 Does that remain your view? 13 A. Yes, it does. 14 Q. Thank you. 15 If I could ask you finally to turn to 8.8.51 -- if 16 that could be amplified, Ralph, again -- and I quote: 17 "8.8.51. A more specific examination of the 18 electrical items and the wires recovered from the 19 southeast corner of the kitchen of flat 16 was 20 undertaken by Dr. Duncan GLOVER ... and the potential 21 sequence of operation of the circuit breakers was 22 discussed. As a result of his examinations Dr. Duncan 23 GLOVER stated that it is 'probable that the fire origin 24 is at the electrical component that caused the circuit 25 breaker for circuit number 7 (the kitchen circuit) to</p> <p style="text-align: center;">Page 70</p>	<p>1 where these particular items were recovered from so that 2 we can put some context and some electrical evidential 3 boundaries around where the potential area of origin as 4 defined by the electrical system would be. 5 Q. If we could de-amplify that, Ralph. If we could next 6 turn to paragraph 8.8.53. 7 This summarises your tallying together, if I can put 8 it like that, of the evidence; is that right? 9 A. Yes, it is. Yes. 10 Q. To quote: 11 "8.8.53. Figure 72 illustrates the southeast corner 12 of flat 16 on the 91h October 2017. This photograph was 13 taken after most of the contents of flat 16 had been 14 removed. The fire patterns within this photograph 15 illustrate physical evidence that suggest the area of 16 origin of the fire to be within the southeast part of 17 the kitchen. These fire patterns include; 18 "(1) Burn pattern on the laminate floor 19 corresponding to the position of the tall fridge freezer 20 "(2) Position of melting on the socket and conduit 21 on the wall next to the tall fridge freezer 22 "(3) Lowest area of burning of the skirting board in 23 the southeast part of the kitchen corresponding to the 24 position of the tall fridge freezer." 25 That remains your view, I assume?</p> <p style="text-align: center;">Page 72</p>

<p>1 A. Yes, it does.</p> <p>2 Q. Thank you.</p> <p>3 Could I turn to the second substantive topic that</p> <p>4 you dealt with in your report, and that was the cause of</p> <p>5 the fire. That's dealt with at section 8.9.</p> <p>6 In your provisional report -- we don't need to go to</p> <p>7 it -- you suggested that in-depth analysis of the</p> <p>8 electrical system of the electrical wiring was required.</p> <p>9 An examination has been provided by Dr Glover; was</p> <p>10 that the examination that you were looking for?</p> <p>11 A. In part, yes. I think that the examination up to this</p> <p>12 point has been non-destructive. There is also the</p> <p>13 option of undertaking destructive analysis. That may</p> <p>14 provide further information in regards to the areas of</p> <p>15 electrical activity that might have occurred.</p> <p>16 Q. How productive do you think destructive testing would be</p> <p>17 in providing more definitive evidence?</p> <p>18 A. That's very hard for me to say because I'm not</p> <p>19 an electrical expert. I'm aware of the fact that there</p> <p>20 is other testing that could be carried out that might</p> <p>21 provide some greater evidence or more evidence that, for</p> <p>22 example, electrical activity occurred or electrical</p> <p>23 activity as a result of the fire might have occurred in</p> <p>24 some of the conductors, perhaps, that Dr Glover was</p> <p>25 talking about yesterday.</p> <p style="text-align: right;">Page 73</p>	<p>1 what's your view as to whether the cause of the fire was</p> <p>2 electrical or non-electrical?</p> <p>3 A. I think, gathering all of the evidence together, and in</p> <p>4 particular the physical evidence, which provides, in my</p> <p>5 view, very strong evidence to suggest that the area of</p> <p>6 origin of the fire was in the base of the fridge</p> <p>7 freezer, and that evidence includes the burn patterns on</p> <p>8 the floor, the skirting board and some of the electrical</p> <p>9 evidence from Dr Glover, particularly relating to the</p> <p>10 alloying of the conductors in that area, on the basis of</p> <p>11 that, it would be my view that the cause of the fire was</p> <p>12 electrical in origin, but the exact nature of that</p> <p>13 cause, so what particular electrical components, remains</p> <p>14 undetermined, in my view.</p> <p>15 Q. I think you've emphasised in your report that your</p> <p>16 expertise doesn't lie in forensic electrical</p> <p>17 examination.</p> <p>18 A. Correct.</p> <p>19 Q. Would it flow from your answer that determining precise</p> <p>20 cause would be best determined by a forensic</p> <p>21 electrical --</p> <p>22 A. Yes, absolutely.</p> <p>23 Q. Thank you.</p> <p>24 Apologies if I'm pressing you on the point, but</p> <p>25 looking as to your answer that it's more likely than not</p> <p style="text-align: right;">Page 75</p>
<p>1 Q. In relation to cause itself, could I ask you to turn to</p> <p>2 paragraph 8.9.5 at page 88. That was the conclusion you</p> <p>3 set out in the report in terms of cause, ie it was</p> <p>4 undetermined.</p> <p>5 Reminding myself that you've set yourself the</p> <p>6 balance of probabilities --</p> <p>7 A. Sorry, this is not that; this is about the area of</p> <p>8 origin, not about the cause.</p> <p>9 Q. Sorry, 8.9.5 at the bottom of page 88.</p> <p>10 Sorry. Thank you, professor.</p> <p>11 A. That's okay.</p> <p>12 SIR MARTIN MOORE-BICK: Better ask the question again.</p> <p>13 MR KINNIER: I think I already have.</p> <p>14 First of all, set out there is your conclusion in</p> <p>15 relation to cause.</p> <p>16 A. Yes.</p> <p>17 Q. Reminding ourselves that you've set yourself the balance</p> <p>18 of probabilities, having regard to the evidence that</p> <p>19 you've considered and having regard to the report that</p> <p>20 Dr Glover provided which you reviewed within this</p> <p>21 report, are you able to conclude, at least on the</p> <p>22 balance of probabilities, that the origin of the fire</p> <p>23 was in the tall fridge freezer?</p> <p>24 A. In terms of the origin, yes.</p> <p>25 Q. In terms of cause of the fire, taking it step by step,</p> <p style="text-align: right;">Page 74</p>	<p>1 that it was an electrical cause --</p> <p>2 A. Electrical in nature, yes.</p> <p>3 Q. How confident are you in relation to that conclusion?</p> <p>4 A. I'm confident that that's -- that's my conclusion.</p> <p>5 Q. Thank you.</p> <p>6 The next topic I'd like to cover is the nature of</p> <p>7 the cause, and it's really whether it was an accident,</p> <p>8 deliberate or whatever.</p> <p>9 A. Okay.</p> <p>10 Q. If I could ask you to turn to page 97, and</p> <p>11 paragraph 9.4, you say in the latter part of</p> <p>12 paragraph 9.4:</p> <p>13 "... it is more likely than not to be an accidental</p> <p>14 cause."</p> <p>15 If I could look at the evidence that you've relied</p> <p>16 upon for coming to that conclusion, first of all, am</p> <p>17 I right in thinking that the material gathered from the</p> <p>18 window end of flat 16's kitchen was examined using the</p> <p>19 services of a hydrocarbon dog?</p> <p>20 A. Yes. They're called hydrocarbon dogs or arson dogs, and</p> <p>21 these are animals that are trained to detect the</p> <p>22 presence of particular chemicals that are in ignitable</p> <p>23 liquids.</p> <p>24 Q. As you said, the dog is looking for any liquid</p> <p>25 accelerants that might have played a role in the cause</p> <p style="text-align: right;">Page 76</p>

<p>1 of the fire; is that --</p> <p>2 A. It's looking for the presence of liquid accelerant</p> <p>3 materials or ignitable liquid materials.</p> <p>4 Q. What was the result of the examination that was carried</p> <p>5 out using the services of the hydrocarbon dog?</p> <p>6 A. The dogs are used as a tool simply to try to help the</p> <p>7 fire investigators in regard to the possible presence of</p> <p>8 an ignitable liquid. That doesn't necessarily mean the</p> <p>9 ignitable liquid wasn't there for a legitimate cause.</p> <p>10 In this particular case, the dog was deployed in the</p> <p>11 kitchen, in my understanding, and the result of that</p> <p>12 particular deployment was a negative result. By that</p> <p>13 I mean there was no ignitable liquid residue detected as</p> <p>14 determined by the dog.</p> <p>15 Q. To be more specific, is it right that the samples of the</p> <p>16 laminate floor were also analysed for the presence of</p> <p>17 ignitable fluid?</p> <p>18 A. Yes, they were examined by Key Forensic Services.</p> <p>19 Q. Again, am I right in thinking that produced a negative</p> <p>20 result?</p> <p>21 A. The conclusion was there was no ignitable liquid present</p> <p>22 in those samples.</p> <p>23 Q. Are you satisfied that the presence of an external</p> <p>24 accelerant, such as petrol or some other similar</p> <p>25 substance, in the area of origin can be discounted?</p> <p style="text-align: center;">Page 77</p>	<p>1 items became involved in the fire other than it was</p> <p>2 after the initial fire in the kitchen.</p> <p>3 "There was less fire damage in the adjacent living</p> <p>4 room than in the kitchen. The sliding doors between</p> <p>5 kitchen and living room had burned away and the fire</p> <p>6 pattern generated by the combustion of the unplugged old</p> <p>7 freezer and smaller fridge can be seen penetrating into</p> <p>8 the living room near the opening left by the living room</p> <p>9 sliding doors ..."</p> <p>10 Stopping there, does that remain your view?</p> <p>11 A. Yes, it does.</p> <p>12 Q. In terms of spread within flat 16, first of all, did you</p> <p>13 listen to Professor Bisby's evidence?</p> <p>14 A. Yes, I did.</p> <p>15 Q. In light of that, and in light of your broader</p> <p>16 consideration of the evidence, is there any further</p> <p>17 assistance you can provide the inquiry in relation to</p> <p>18 the spread within the kitchen of flat 16?</p> <p>19 A. No, I don't believe so.</p> <p>20 Q. Thank you.</p> <p>21 The final topic I'd like your assistance on, really.</p> <p>22 The final question I asked Dr Glover yesterday</p> <p>23 related to experience in the US of metal backings to</p> <p>24 fridges.</p> <p>25 First of all, in your experience, have you had any</p> <p style="text-align: center;">Page 79</p>
<p>1 A. Yes.</p> <p>2 Q. Absolutely?</p> <p>3 A. Yes.</p> <p>4 Q. Is there any evidence you've seen which would indicate</p> <p>5 anything other than an accidental cause?</p> <p>6 A. No.</p> <p>7 Q. Thank you.</p> <p>8 The penultimate topic I'd like to cover with you,</p> <p>9 professor, and that's the spread of the fire within</p> <p>10 flat 16.</p> <p>11 A. Yes.</p> <p>12 Q. Your analysis is set out in section 8.10 of your report</p> <p>13 and, in particular, paragraph 8.10.10.</p> <p>14 If I could ask Ralph to amplify that.</p> <p>15 That paragraph says this, and I quote:</p> <p>16 "8.10.10. Within the kitchen, there appears to be</p> <p>17 more fire damage at a level above the work tops with the</p> <p>18 exception of (1) damage to the external surfaces of</p> <p>19 cupboards closest to the hallway (2) the damage revealed</p> <p>20 to the laminate flooring under the tall fridge freezer</p> <p>21 in the southeast corner (3) a burn pattern that reaches</p> <p>22 to the floor to the North side by the window associated</p> <p>23 most likely with the combustion of the old freezer and</p> <p>24 smaller fridge that were reported to be present in this</p> <p>25 area by Mr Behailu KEBEDE ... It is uncertain when these</p> <p style="text-align: center;">Page 78</p>	<p>1 experience or knowledge of the success of metal backs</p> <p>2 containing fires within domestic fridge freezers, or</p> <p>3 domestic fridges, for that matter?</p> <p>4 A. Only almost a layman's knowledge. So there's been some</p> <p>5 work done within the UK by the London Fire Brigade</p> <p>6 looking at the speed at which flames can develop outside</p> <p>7 or up against the back of fridge freezers, some of which</p> <p>8 are plastic-backed and some of which are metal-backed.</p> <p>9 Those tests show quite clearly -- they are videoed</p> <p>10 tests -- that the spread of the flame out of the</p> <p>11 appliance and up the back of it is slowed down by having</p> <p>12 a metallic back.</p> <p>13 Now, I would note that the two tests are done where</p> <p>14 the fridge freezers that are being burnt are facing</p> <p>15 outwards, so they're not in a corner configuration or</p> <p>16 placed in situ within a compartment, so it's uncertain</p> <p>17 as to how much of a retarding effect in terms of flame</p> <p>18 growth this would have in a kitchen appliance placed</p> <p>19 within a kitchen, if you like.</p> <p>20 MR KINNIER: Thank you, professor. Those are all the</p> <p>21 questions I have for now.</p> <p>22 Sir, may I ask for the customary break to see if</p> <p>23 there are any other matters I haven't covered which</p> <p>24 I ought to have done.</p> <p>25 SIR MARTIN MOORE-BICK: Counsel needs a moment to check his</p> <p style="text-align: center;">Page 80</p>

<p>1 questions. We'll rise for 5 minutes to give him that</p> <p>2 opportunity. So if you would like to go with the usher,</p> <p>3 we'll come back in 5-minutes' time.</p> <p>4 THE WITNESS: Thank you.</p> <p>5 SIR MARTIN MOORE-BICK: Right, Mr Kinnier, I'll say</p> <p>6 12 o'clock, then.</p> <p>7 MR KINNIER: Thank you, sir.</p> <p>8 SIR MARTIN MOORE-BICK: Thank you very much.</p> <p>9 (11.55 am)</p> <p>10 (A short break)</p> <p>11 (12.00 pm)</p> <p>12 SIR MARTIN MOORE-BICK: All right, professor?</p> <p>13 THE WITNESS: Yes, thank you.</p> <p>14 SIR MARTIN MOORE-BICK: I don't know whether there are more</p> <p>15 questions. Perhaps there are today.</p> <p>16 MR KINNIER: One.</p> <p>17 SIR MARTIN MOORE-BICK: One.</p> <p>18 MR KINNIER: Thank you, professor.</p> <p>19 First of all, mindful that you're not a forensic</p> <p>20 electrical engineer, was there anything in Dr Glover's</p> <p>21 report or addendum that caused you to change your view,</p> <p>22 first of all, on area of origin?</p> <p>23 A. Could you say that again, please?</p> <p>24 Q. You're not a forensic electrical engineer.</p> <p>25 A. Yes.</p> <p style="text-align: right;">Page 81</p>	<p>1 THE WITNESS: Thank you.</p> <p>2 SIR MARTIN MOORE-BICK: Thank you very much.</p> <p>3 (The witness withdrew)</p> <p>4 SIR MARTIN MOORE-BICK: Well, now, Mr Kinnier.</p> <p>5 MR KINNIER: Sir, save for one matter, that concludes the</p> <p>6 evidence of today.</p> <p>7 The outstanding matter is that I'm required to read</p> <p>8 in certain position statements received by the inquiry.</p> <p>9 If I may ask Ralph to draw up INQ00000533_001.</p> <p>10 Sir, may I formally read in the position statements</p> <p>11 of the MHCLG, the Home Office, the LFB, the Mayor of</p> <p>12 London and RBKC, and the supporting end notes and</p> <p>13 exhibits.</p> <p>14 SIR MARTIN MOORE-BICK: Thank you.</p> <p>15 For the benefit of those who may be wondering what</p> <p>16 on earth you are doing --</p> <p>17 MR KINNIER: It has been asked.</p> <p>18 SIR MARTIN MOORE-BICK: -- these are position statements</p> <p>19 which have been provided by those bodies in response to</p> <p>20 requests from the inquiry to tell us what steps they've</p> <p>21 taken in response to the disaster.</p> <p>22 MR KINNIER: That's right, sir.</p> <p>23 With that, that concludes today's evidence.</p> <p>24 SIR MARTIN MOORE-BICK: Good. Well, thank you very much.</p> <p>25 So we'll break there. We'll sit again tomorrow at</p> <p style="text-align: right;">Page 83</p>
<p>1 Q. Was there anything in Dr Glover's report or addendum</p> <p>2 that caused you to change your view on, first of all,</p> <p>3 area of origin?</p> <p>4 A. No.</p> <p>5 Q. Again, was there anything in Dr Glover's report or</p> <p>6 addendum that caused you to change your view that, in</p> <p>7 relation to cause, it was electrical in origin?</p> <p>8 A. It was electrical in nature. That would be how I would</p> <p>9 put it, yes.</p> <p>10 Q. And there was nothing --</p> <p>11 A. No, sorry, I beg your pardon. No, there was nothing</p> <p>12 that caused me to change my view.</p> <p>13 MR KINNIER: I'm grateful, professor. That leaves me to say</p> <p>14 thank you very much for coming to give your evidence</p> <p>15 today. It's very much appreciated.</p> <p>16 THE WITNESS: Thank you.</p> <p>17 SIR MARTIN MOORE-BICK: It certainly is. I would like to</p> <p>18 thank you very much on behalf of all of us for putting</p> <p>19 your undoubted expertise at our disposal, for writing</p> <p>20 these reports and coming along to explain them to us.</p> <p>21 It has been very interesting and useful.</p> <p>22 THE WITNESS: It was a privilege. Thank you.</p> <p>23 SIR MARTIN MOORE-BICK: That's it, as far as you are</p> <p>24 concerned. If you would like to go with usher, she'll</p> <p>25 look after you.</p> <p style="text-align: right;">Page 82</p>	<p>1 10 o'clock, when we'll hear from another expert witness</p> <p>2 to the inquiry.</p> <p>3 MR KINNIER: Professor Purser.</p> <p>4 SIR MARTIN MOORE-BICK: Good. Thank you very much.</p> <p>5 10 o'clock tomorrow, please.</p> <p>6 (12.10 pm)</p> <p>7 (The hearing adjourned until Thursday, 29 November 2018</p> <p>8 at 10.00 am)</p> <p>9 I N D E X</p> <p>10 PROFESSOR NIAMH NIC DAEID (affirmed)1</p> <p>Questions by MR KINNIER.1</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p> <p style="text-align: right;">Page 84</p>

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